

COMPUTERWORLD

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HP demos object-oriented relational database management system. Page 129.

Glut of 286-based PCs keeps corporate buyers in the driver's seat. Page 43.

With this issue: Premiere of *Computerworld Focus on Integration*.



Exec puts DB2 in OS/2 ring

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Users may soon have a new window on IBM's DB2 relational database management system, and its name is OS/2 Extended Edition, an IBM official said last week.

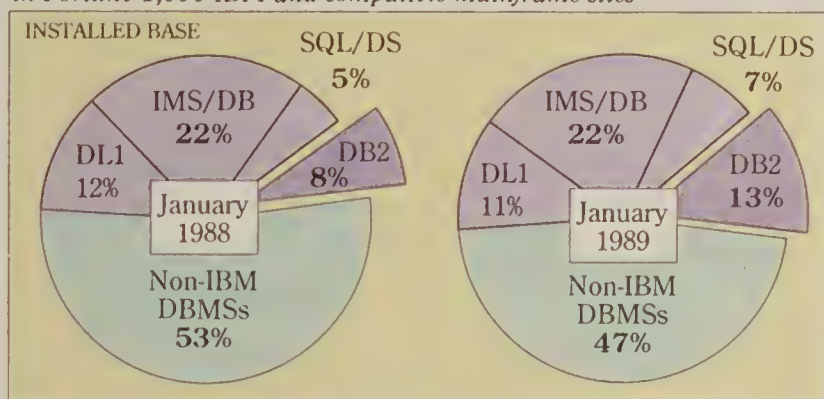
"We are getting into a world where the only window [on DB2] is in OS/2, mainframe or otherwise," said Jnan Dash, manager of IBM's Data Systems Strategy in Santa Teresa, Calif., during a speech at Database '89 here.

Dash also told his audience of 200 MIS managers that IBM's Systems Application Architecture will provide a seamless interface to DB2, no matter what the user's hardware platform.

When IBM announced transparency between multiple DB2 databases on mainframes last October, it also announced its intention of delivering the same transparency within other SAA environments. Now, another IBM manager explained last

On the march

DB2 is now the second most popular IBM database management product in Fortune 1,000 IBM and compatible mainframe sites



SOURCE: COMPUTER INTELLIGENCE
CW CHART: JOHN YORK

week, OS/2 Extended's database manager will be the vehicle through which that transparency will be provided to end users.

The QMF facility in OS/2 now allows DB2 queries to be sent up to the mainframe, IBM said, but the process is carried out by a series of deliberate steps. Within two years, those steps will be "hidden" from end users, and

queries will be made automatically to DB2 systems on remote mainframes, IBM said. In this way, DBMS updates will be managed at a small number of central sites, while access to the updated data will be provided throughout the network.

OS/2 development is being coordinated through an IBM lab-
Continued on page 129

DEC-Apple deal a dud?

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — At the one-year anniversary of the Apple Computer, Inc. and Digital Equipment Corp. alliance, both firms' corporate customers are finding little reason to celebrate.

Apple and DEC entered into a vague partnership in a glittering ceremony presided over by Apple Chairman and Chief Executive Officer John Sculley and DEC President Kenneth Olsen at the Macworld Expo in San Francisco in January 1988. DEC and Apple executives pledged to address significant user concerns, including file sharing between the two systems and the ability to access VAX databases more efficiently from Apple's Macintosh computers.

Today, the plans seem like nothing more than empty promises.

"I am very disappointed, especially in light of how much

noise was made in the beginning," said David Newman, an assistant vice-president of information systems at Citibank N.A. in New York. "I had expected products from Digital to connect the Macs to VAXs."

"We've been hard on Digi-
Continued on page 8

Slow start-up for graphics powerhouses

BY JAMES DALY
CW STAFF

The roses weren't the only things in bloom last spring.

In quick succession, industry newcomers Ardent Computer Corp. and Stellar Computer, Inc. hosted coming-out parties for the graphics supercomputer, a powerful graphics-intensive machine that promised to quickly hurdle the high-end workstation market and make the personal supercomputer a reality.

At first blush, it seemed like they would succeed. Eye-popping graphics and processing power that carved through the most compute-intensive applications made the single-user machines a natural

— and welcome — bridge between high-end workstations and minisupercomputers.

But almost a year later, the seeds planted by the companies



Ardent's 64 MFLOPS Titan can process images like this, but do users care?

have yet to reach fruition, largely slowed by an industry unable to fully exploit the machines' explosive potential. Networking bottlenecks, a lack of wide-rang-

Glimpse of AT&T's net future

BY ELISABETH HORWITT
CW STAFF

AT&T was the focal point of a tangled web of network management links and alliances last week that left users closer to — but by no means within grasping distance of — the multivendor system of their dreams.

AT&T introduced Accumaster Integrator, the first solid product for managing other vendors' systems via its Unified Network Management Architecture.

The AT&T system is said to have unique troubleshooting capabilities, as well as sophisticated graphics and windowing features that are still conspicuously missing from IBM's Netview. However, the initial product will only be able to collect alarm and alert information from other vendors' systems — a much-criticized limitation of IBM's multivendor interface, Netview/PC.

Integrator is significant because it is the first visible piece of UNMA for users to evaluate, according to Stan Welland, director of corporate telecommunica-
Continued on page 6

ing software applications and premium price tags have bridled the market's growth. The machines are getting out, but at such low volume and narrow profit margins that some analysts predict the niche will disappear before it has a chance to survive.

"They've shown we have the horsepower to do sophisticated graphical applications, but the question remains, what do we do with these images once we have them displayed?" said Ajit Kapoor, senior vice-president for electronic imaging systems at Cap International, Inc., a research firm in Norwell, Mass.

The machines are targeted at users who require high-speed
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Out on a limb. Wang goes for the gusto with mainframe-class high-end mini positioned against the IBM 3090. Analysts say it's barking up the wrong tree. Page 4.

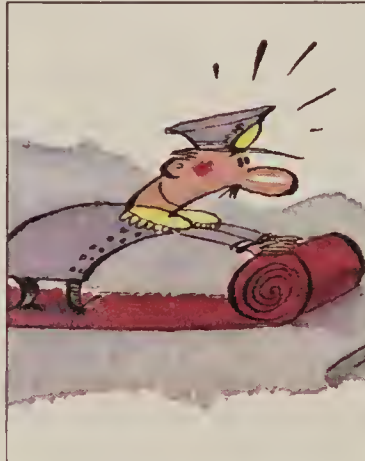
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They still need to prove to users what is so super about these so-called super devices."

AJIT KAPOOR
CAP INTERNATIONAL

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NEWS

FBI expected to throw book at virus suspect

BY MICHAEL ALEXANDER
CW STAFF

The U.S. Justice Department appears close to filing felony charges against Robert T. Morris Jr., the 23-year-old suspected hacker accused of creating the worm program that caused the shutdown of some 6,200 computers systems on the Internet network in November.

"The truth is, they are going to prosecute," said Thomas Guidoboni, the Washington, D.C., attorney hired by Morris. He added that he expects felony charges to be filed against his client within a matter of weeks.

However, according to a report last week in *The New York Times*, the U.S. Attorney's office in Syracuse, N.Y., which is heading the grand jury probe into the worm attack, and Justice Department officials are at odds on how to handle the case.

According to the *Times* report, the U.S. Attorney's office reportedly recommended charging Morris, who briefly attended Cornell University as a computer science graduate student, with a misdemeanor in exchange for limited immunity and information about the incident.

But Federal Bureau of Investigation and Justice Department officials are adamantly opposed to plea bargaining in this instance and are pushing for a more severe punishment as a deterrent, according to the article.

Felony frustration

"I would prefer not to do either one [misdemeanor or felony], and they haven't made an offer of either one," Guidoboni said. "I have already made it clear to [the Justice Department] that I am not interested in talking about felonies."

Guidoboni speculated that the U.S. Attorney's office in Syracuse may be considering the lesser charge because it may lack sufficient evidence to make a felony charge stick.

"We have no announcement to make and no comment on the investigation," said Frederick J. Scullin Jr., U.S. Attorney for Northern District of New York, who is heading up the grand jury investigation in Syracuse into the incident. "It has been time involved; there has been a lot of investigating to do, and it is still going on."

Calls to the Justice Department were not returned.

"If they allow a plea bargain, they are making a serious mistake," said Robert Campbell,

PLEA bargaining will water down a case that is already not the strongest."

ROBERT CAMPBELL
ADVANCED INFORMATION
MANAGEMENT

president of Advanced Information Management, Inc. in Woodbridge, Va.

"They will send out the wrong message that people can get away with this sort of thing. I think that it is difficult enough with the existing framework of laws to exact punishment; plea bargaining will water down a case that is already not the strongest," he said.

"It is clear to me that the FBI is pursuing prosecution to the fullest," said John McAfee, president of the Computer Virus Industry Association. McAfee said that the Santa Clara, Calif.-based trade group had been contacted by the FBI for assistance in compiling an elaborate cost analysis of the incident.

The trade group calculated that the worm infection ultimately caused \$100 million in lost computing time and in manpower to detect and eradicate the worm.

CORRECTION

F

No, there is no word "creeze" in the dictionary. Above is the letter F, which in a production foul-up last week was usurped by the letter C in our page 1 story on Visa U.S.A., Inc.'s credit card network operations.

We were as surprised as anyone to see the mystery word show up on Monday morning, considering that page 1 undergoes rigorous scrutiny — in fact, every member of our staff gets a proof copy before it is signed off. In this case, a misread instruction at the printer resulted in the wrong letter being used. There's nothing like a disaster to prompt a solution, and we've since implemented a method that should prevent a reoccurrence.

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Wang wields new high-end mini

BY ROSEMARY HAMILTON
CW STAFF

Wang Laboratories, Inc. officially set out for the big time last week with the introduction of a high-end minicomputer and associated peripherals and software options designed for core data processing operations.

But observers said Wang should stick to its own customer base, in which it can turn a nice profit by upgrading users to the VS10000, instead of shooting for mainframe-class business.

"I laugh when I think of these minicomputer companies going up against IBM," said Barry Bosak, an analyst at Robert Fleming Securities Ltd.

Nonetheless, the company has positioned its offering against the low-end IBM 3090 and said it intends to snatch new customers with it.

To show that it is off to a fast start, Wang trotted out a number of users that have already bought the system. But they were all previous Wang computer users.

The early users were full of praise for the new system, which they said gives them the big performance boost they have been seeking. One customer has al-

ready shifted into production mode with his VS10000, and two others who are testing the system said they have encountered only minor glitches.

It's a winner

At Scottsdale Insurance Co. in Scottsdale, Ariz., the recently installed VS10000 has been declared a winner, according to Ronald Pieper, vice-president of data processing. Pieper said the company runs a nightly batch job to update its master file of insurance policies. It typically required seven hours to perform on the VS7310. The same batch job took two hours on the VS10000, Pieper noted.

"It's almost anticlimactic," said David Briezy, director of MIS at Admiral Cruises in Miami, where a VS10000 was installed at the end of last year. "It came in and passed all the diagnostics and tests with a few burps and hiccups. Now, we're running our accounting, purchasing and Pace [Wang's database management system] and [are also supporting] the programming staff."

Briezy and other users said they are impressed with the raw performance of the system. Depending on the application envi-

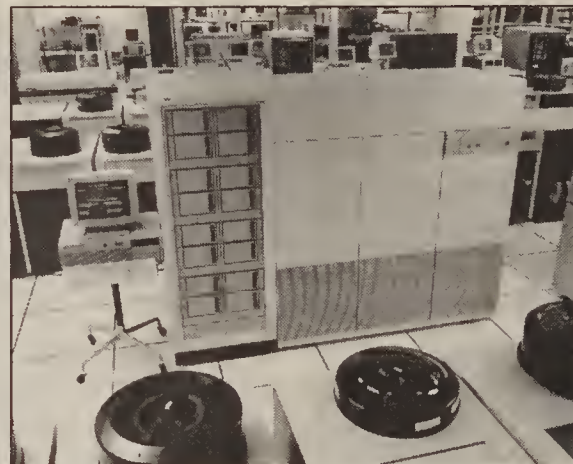
ronment, the VS10000 can offer up to four times the performance of Wang's previous high-end system, the VS7000 series, which runs at an estimated 3 million instructions per second (MIPS).

That performance boost can be achieved for about 1.7 times the cost of the VS7000.

The air-cooled VS10000, designed for a computer room, will be offered in three different configurations, which differ primarily in CPU performance.

Prices range from \$395,000 to \$670,000.

Wang does not provide MIPS estimates but instead explained the CPU performance differences with internal results from a benchmark originally done at U.S. Steel Corp. (now USX Corp.). Based on that benchmark, the low-end VS10000 Model 50 would be given a relative performance rating of 1. On that scale, the mid-range Model 75 is rated at 1.25 and the high-end Model 100 is rated at 1.61.



Wang's VS10000 environment boosts power

user to maintain more than 17G bytes of data in a 6-foot enclosure.

The software product announcements also testified to Wang's hopes of moving into DP environments. Instead of offering departmental or office tools, Wang introduced software options to increase the system's

availability, upgrade its security and monitor its performance.

Enhanced System Access Control, for example, will be offered as an optional security package to beef up the VS operating system. This product includes new encryption features for controlling access and protecting data and has a starting price of \$2,500.

The VS Extended Data Management System (XDMS) is said to offer improved ways of setting up indexed files for quick access.

In addition, it reportedly provides a roll-forward recovery feature that allows a user to quickly restore the indexed files after a system crash. XDMS' starting price is \$2,500.

The total package should be looked at as a positive step for Wang's customers, according to John McCarthy, director of professional systems research at Forrester Research, Inc. "This is telling the customers the VS is alive and well," McCarthy said. "I think it can be very profitable for them."

Caching controller

Along with the VS10000, Wang introduced a storage controller that has a caching capability, a feature typically found in mainframe environments. The controller will support another product, a 1G-byte disk drive. The controller, which can support up to four of these drives, sells for \$19,000. A 1G-byte drive will be offered for \$25,000.

Wang released a storage cabinet that will accommodate up to 16 of the 8-in. 1G-byte storage platters. The cabinet will allow a

Bucking for mainframe business

Wang's latest supermini line, the VS10000, will be available in three configurations

	Model 50	Model 75	Model 100
Minimum main memory (in bytes)	16M	32M	32M
Maximum number of users	192	192	192
Relative CPU performance*	1	1.25	1.61
Price	\$395,000	\$550,000	\$670,000

* Based on Wang's results of the U.S. Steel benchmark

CW CHART: FRANK C. O'CONNELL

Computer to determine amounts in GM bias suit

BY WILLIAM BRANDEL
CW STAFF

General Motors Corp. has settled a 5-year-old racial discrimination lawsuit by having compensation determined by an unbiased third party: a computer system.

Under the conditions of a preliminary agreement reached with the plaintiffs last week, GM, without admitting guilt, has conceded that its employee-appraisal system has "hampered the equitable awarding of pay increases and promotions to black employees," a GM spokeswoman said.

To resolve the dilemma, a computer modeling system will calculate what type of compensation an employee should receive based on factors including education, experience and the amount of time the individual has been with the corporation.

This is the first time a computer has been used to determine relief resulting from a lawsuit, said Dennis James, an attorney for thousands of GM employees represented under the class-action suit.

So far, GM has agreed to pay \$3 million to 3,800 past and current employees affected by alleged racial bias but could be ex-

pected to pay as much as \$50 million in additional compensation, according to James. Much of the compensation will be determined by the computer monitoring system.

"After months of negotiations, we had to work out something that would assure fairness in the future," James said. "With this system, it's not just a payoff where you wave good-bye and then they go do it again."

Monitoring expectations

GM has more than 100 facilities with thousands of different job descriptions and expectations that it must monitor. Bias aside, people cannot be expected to fairly calculate the huge mathematical equation that will assess what type of promotion or raise an employee should receive, James said.

After compiling personnel

data, the system will compare the promotions and salaries white workers are receiving at a particular moment and then apply those factors to what black employees are receiving.

The system will help determine if bias exists by using the statistical formula, James said. "And if they missed [compensating blacks] by a significant amount, [odds are] better than 95% it was not just by chance," he said.

The results of the computations will be monitored by the plaintiffs' attorneys and GM, James said.

A GM spokeswoman would not specify details regarding the antibias system.

The preliminary agreement will not become final until after a fairness hearing is held in about two months, the spokeswoman said.

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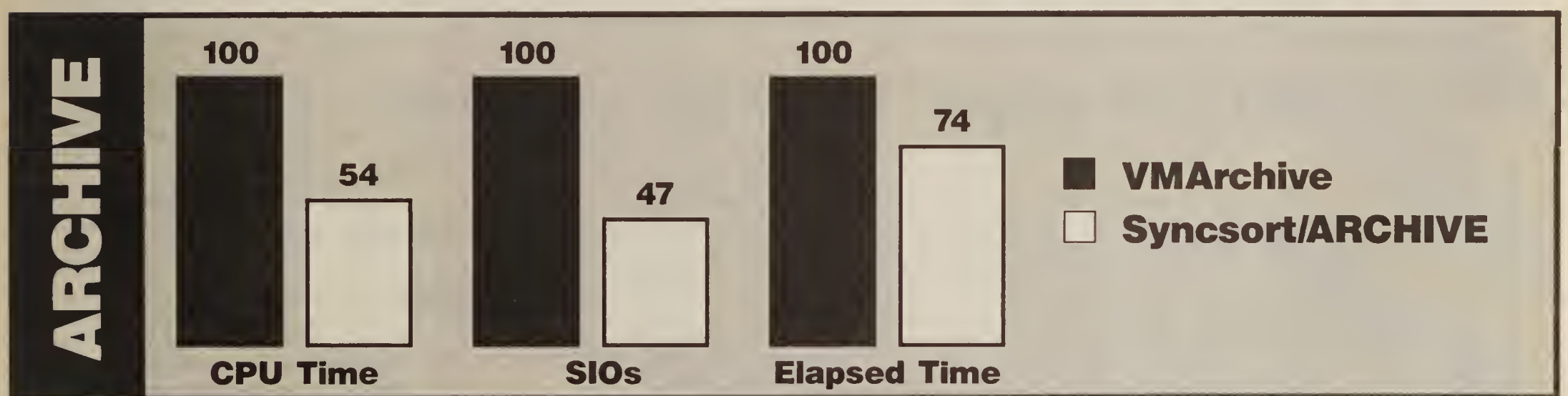
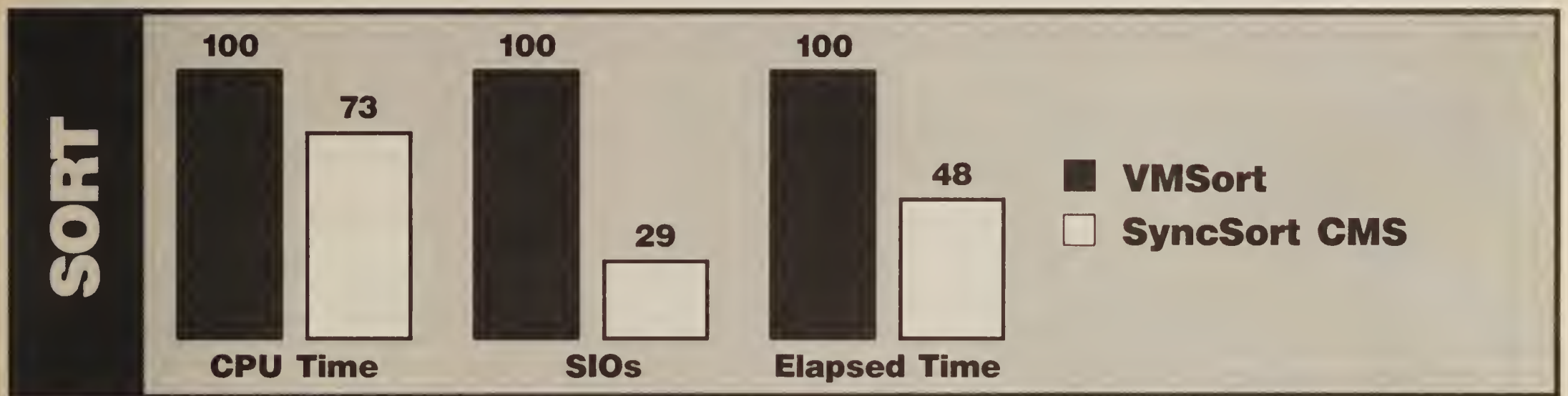
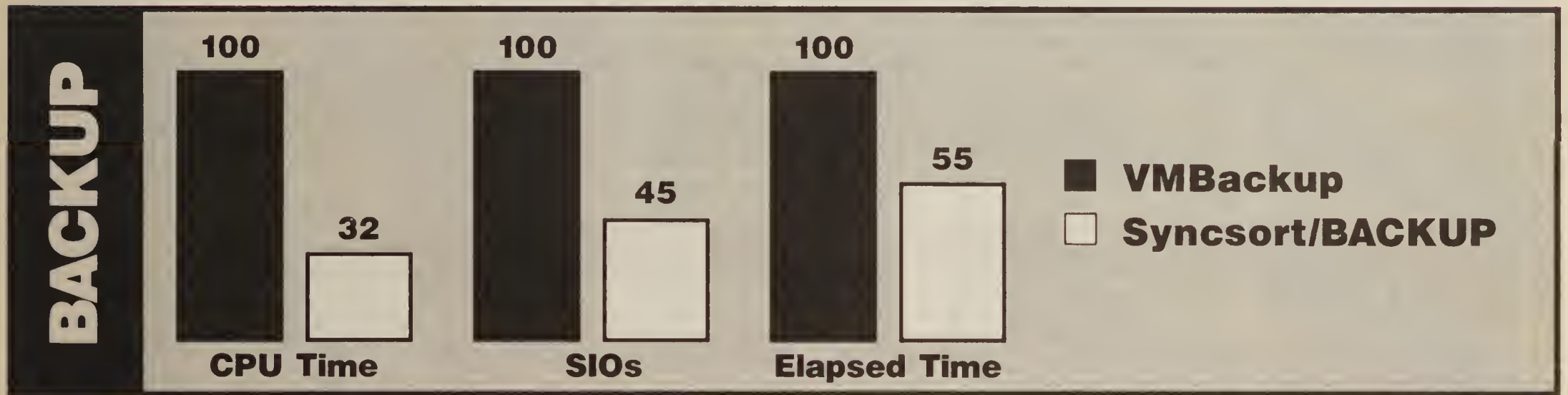
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WHERE PERFORMANCE IS THE ISSUE.

AT&T

FROM PAGE 1

tions for General Electric Co. "It's good to see another horse in the race, and at least now you can see what the horse looks like," he said.

The fact that Integrator "has a lot more in the way of visual displays and graphic capabilities vs. Netview" may convince GE to use UNMA to complement, if not replace, IBM's system, Welland said. GE already has several Netview installations in its data centers and is considering standardization on IBM's product. But the Integrator's sophisticated graphics may be one feature that the company could "want badly enough to justify getting a second network management system," Welland reported.

AT&T also introduced the first UNMA-based application, Accunet T1.5 Information Manager, which is said to present users with alarms, performance

and configuration data about AT&T's T1 service in graphic form. Availability is slated for April. AT&T plans gradually to bring management of its other network offerings under the UNMA umbrella, said AT&T spokesman Donald Keller.

Another key Integrator feature, the Correlator, reportedly makes use of an Informix Software, Inc. network configuration database to pinpoint the source of a problem.

For example, a T1 switch malfunction could affect communications on a variety of devices using that link (see diagram below). Accumaster Integrator would receive alerts from the network management system responsible for each device, correlate that information with network configuration data and arrive at the most likely source of the trouble. The user can then invoke the network management system responsible as a window on the Integrator's screen to initiate a test or recon-

figure traffic around the fault.

Through Cincom Systems, Inc.'s Net/Master UNMA, the Integrator can also correlate fault data from both the physical and logical side of the network, according to Walter Thomas, Cincom's director of management products. Net/Master UNMA, also announced last week, is said to provide the Integrator with IBM Systems Network Architecture network alerts and alarms, generated either by Cincom's Net/Master or IBM's Netview. Because AT&T provides no Netview/PC connection for its product, users do not have the choice of having alerts and alarms pass in the other direction — from AT&T network offerings to IBM's Netview.

Some 18 vendors, including Infotron Systems, Inc., Digital Communications Associates, Inc., Racal-Milgo and Cincom, announced plans to develop links between their network management systems and Accumaster Integrator by the year's end.

With the exception of Cincom's Net/Master UNMA, however, none of these products will make use of Network Management Protocol (NMP), which is AT&T's official full-function, multivendor connection to UNMA. Instead, the products use a limited, NMP-compatible link, which was designed specifically to carry alerts and which "does not lend itself to additional functions we expect to roll out in the future," Keller said. Such functions will include security management and analysis of performance areas such as traffic and error statistics, he indicated.

While AT&T published the NMP specifications last year, it

DCA plays the field

Digital Communications Associates, Inc. apparently intends to have its Open Network Management System (ONMS) play in everybody's ballpark. Last Monday, one day before it announced a software link to AT&T's Unified Network Management Architecture, DCA announced a joint agreement to integrate its system with Meridian Network Controller, from AT&T's archival, Northern Telecom, Inc.

DCA and Northern Telecom reportedly are the first vendors to announce plans to integrate their respective management systems using Common Management Information Services/Protocol, an Open Systems Interconnect Draft International Standard for data exchange among network management systems.

The resulting product will "provide the ability to manage Northern Telecom's PBX network along with our 9000 T1 backbone in an integrated, coherent fashion," said Joe Rosenthal, DCA's president of strategic planning.

Initial development work will focus on fault management functions such as transfer of alarms and trouble ticketing, according to Ian Sugarbrood, Northern Telecom's director of network technology.

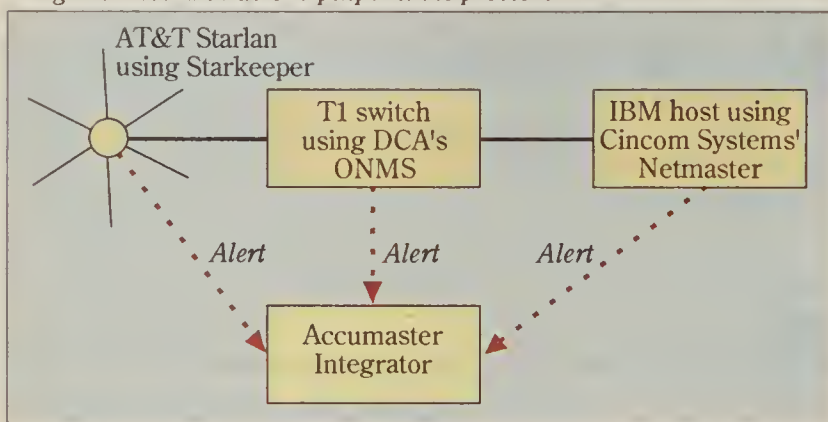
The co-developers also plan a feature, similar to AT&T's Correlator, that "lets the user see where the problem is and its severity," even when several sources report the same problem, Sugarbrood said. Future development work will focus on other network management areas such as configuration management and incorporating more of the two vendors' product lines into the system, he added.

DCA has already announced a link to IBM's Netview/PC interface, as well as intentions to support Digital Equipment Corp.'s Enterprise Management Architecture.

ELISABETH HORWITT

Managing net managers

In a theoretical configuration, a problem on a T1 switch would prompt network alert messages from three sources, but AT&T's Accumaster Integrator would be able to pinpoint the problem



CW CHART: JOHN YORK

AT&T's Open Look support vanishing

BY AMY CORTESE
CW STAFF

NEW YORK — After failing to stir up excitement among software developers, AT&T's Open Look suffered its latest blow last week as its closest supporters distanced themselves from the graphical user interface. At a briefing here last week, Unix International, Inc. backed off from supporting Open Look, while AT&T conceded the interface would definitely not be bundled with the next release of Unix System V.

Many analysts concurred last week that Open Look's days are numbered. John McCarthy, director of professional systems research at Cambridge, Mass.-based Forrester Research, Inc., predicted that the Open Software Foundation's (OSF) OSF/Motif will be the standard interface in the Unix world and that "Open Look will become a great trivia question." George Schussel, president of Digital Consulting, Inc. in Andover, Mass.,

agreed, saying, "Two or three years from now, Open Look will have disappeared."

Although many software developers remain undecided about which, if any, Unix-based user interfaces they will develop applications for, most have already begun developing for Presentation Manager and IBM and Microsoft Corp.'s OS/2. When these vendors start developing for Unix, the easiest port will be OSF/Motif, which shares Presentation Manager's look and feel, McCarthy said.

Defeat in the graphical interface area does not necessarily spell defeat for Unix System V, however. McCarthy said although this setback will put more pressure on AT&T to be "more market savvy," it will not impact AT&T's Unix business. Harder hit will be Sun Microsystems, Inc., which will have to support "an Open Look that looks a lot more like Presentation Manager," he claimed.

AT&T first began backing off from its unconditional support of

Open Look several weeks ago when it began saying that Open Look might not be bundled with Unix System V Release 4, as originally planned. Last week, Robert Kavner, president of AT&T's Data Systems Group, said that it would not be included but would be offered separately.

Also, Donald Herman, organizing chairman of Unix International, said that the consortium is evaluating other interfaces and is not necessarily committed to Open Look. Herman said that Unix International would possibly announce its preference within the next few weeks.

"If Unix International members feel they would like a particular tool kit with a choice of look and feel, I suggest Larry [Dooling, president of AT&T's Unix software division] listen," Kavner said. Tom Mace, Unix International's director of marketing and promotions, said although there is no turning back from supporting Open Look, the group will discuss the subject of user interface.

Unix group shows form, not substance

BY AMY CORTESE
CW STAFF

NEW YORK — Unix International, Inc. last week revealed some long-awaited details of its operations. The group, which is structured by levels of bureaucracy, will advise AT&T on the development and licensing of Unix System V.

The group announced its intent to form more than three months ago, along with AT&T's statement that it would spin off its software operations into a separate business dubbed the Unix Software Operation. The separation of AT&T's software from its hardware operations will take place gradually this year. Both actions are aimed at appeasing licensees of AT&T's Unix operating system.

The recent moves are long in

coming, analysts said, and will influence future releases of Unix System V more so than Release 4.0, which is due in the second half of this year.

The Open Software Foundation (OSF), in comparison, has moved swiftly in fulfilling its objectives, including specifying a graphical user interface.

Robert Kavner, president of AT&T's Data Systems Group, said there was a natural market need for Unix International, and, in a reference to OSF, said it was not a "made market requirement."

There are three tiers of membership, ranging from principal members, who pay \$500,000 annually, general members paying \$100,000, and associate members paying \$10,000. Membership privileges are granted according to membership class. Of the 45 members of Unix International, principal members include Amdahl Corp., AT&T, Control Data Corp., Fujitsu Ltd., NCR Corp., NEC Corp., OKI Electric Industries Co., Olivetti USA, Prime Computer, Inc., Sun Microsystems, Inc. and Unisys Corp.

Leading Edge sells for reported \$921K

BY ALAN J. RYAN
CW STAFF

NEWTON, Mass. — Leading Edge Products, Inc., one of the first companies to capitalize on the wave of Asian clones of the IBM Personal Computer, will be changing hands soon, and its founder, Michael Shane, will pursue other interests.

Shane, who once sold wigs and blue jeans, has publicly claimed that the expense and hassles of his ongoing legal battles with Mitsubishi Electric Co. have spurred the sale of the once bustling clone distributor. Mitsubishi supplied the original Leading Edge computers, which are now made by Daewoo America International Corp.

PC Systems, a Riviera Beach, Fla., microcomputer dealership owned by Stewart Fason, will reportedly pay \$921,000 for Leading Edge. A Leading Edge computer division executive would not confirm the selling price of the company.

Fason met with Leading Edge dealers in Chicago late last week and said he will retain the Leading Edge name on the

computers, saying that the name is a major draw for customers. For instance, the Cordata Systems machine also manufactured by Daewoo "is every bit as good as this one, but this one sells [at a ratio of] 20-to-1 over them," he said.

Aaron Goldberg, an analyst at International Data Corp., a market research firm in Framingham, Mass., said that the name still carries strong positive connotations, many of which stem from a favorable review of the computer in *Consumer Reports* magazine several years ago.

Goldberg said Shane may have chosen a good time to leave Leading Edge.

"Rather than change his margins and the way he did business, he rode it as far as it would go and has left it now," he said.

Under Shane's guidance, Leading Edge became a major player in the clone marketplace. "At one point during 1987, we estimate they had somewhere around 3% to 4% of the [PC] market," Goldberg said. Sales rose to \$200 million in 1988. While the computers were popular with users because of their high quality and reasonable prices, dealers were not always pleased with the company's tactics, which included insisting that dealers pay up front before orders were shipped.

Also, legal trouble with Mitsubishi began after a feud over price cuts in the industry, and Leading Edge began buying its computers from Daewoo, which makes the computers in South Korea.

But the lack of an early entry in the marketplace of PCs based on Intel Corp.'s 80286 chip hurt the firm, Goldberg said, as did the costly lawsuit against Mitsubishi. The company dropped in size through attrition and layoffs from roughly 200 a year ago to 90 to 100 employees now.

Fason said Leading Edge workers located in Massachusetts would not be retained. "All I bought was the trademark. I didn't buy any physical fixtures or liabilities," he said. However, Fason said he has agreed to "take care of dealers so they don't wind up with nothing."

Hopes for academic merger die

BY GLENN RIFKIN
CW STAFF

A proposed merger between the two major professional associations concerned with computing and higher education has collapsed. Cause and Educom began negotiating a merger of the two organizations last April, but spreading discontent among Cause members at its annual meeting in Nashville in November spurred the group's leaders to rethink the coupling.

Officially, the Cause board of directors stated that it "did not do as much work as necessary to demonstrate to our membership the many advantages of a merger."

At the Nashville meeting, it was clear that many Cause members felt their annual conference would simply get swallowed by the Educom group, which traditionally has more than twice as many attendees at its annual meeting. Cause represents those in the administrative side of campus computing, while Educom focuses on the academic and technical computing environment.

The two groups have traditionally been at odds on many technology issues on campus. Kenneth King, head of Educom, expressed disappointment at the merger collapse, saying that his organization was enthusiastic about the proposed link. "There are understandable tensions between the two factions on campus, and my suspicion is that those tensions caused the collapse," King said.

Jane Ryland, president of Cause, said, "It would have been a shotgun wedding with reluctant in-laws. It's better to let the families get to know each other through more cooperative initiatives."

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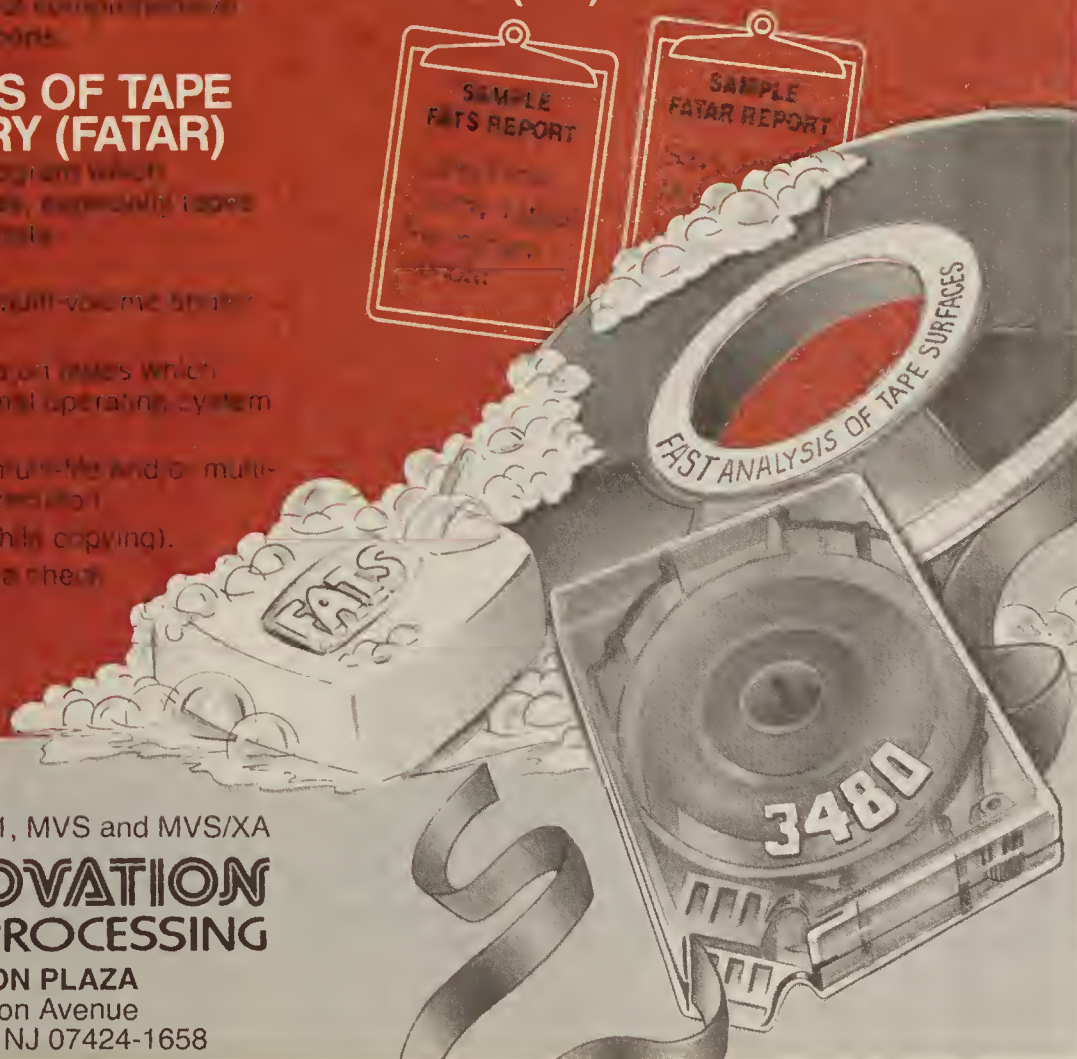
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NEWS SHORTS

From the halls of justice

If you still have it, it could not have been stolen. That was the bottom line of a Finnish municipal court ruling that threw out theft-of-data allegations against four businessmen and a former computer operator. The ruling, which upset some members of Finland's MIS community, said that while the defendants could be convicted of stealing \$180 worth of cassette tapes, they could not be found guilty of copying the data on the tapes — valuable client information of the Sampo Oy insurance company in Turku, Finland — in conjunction with a plan to buy out the firm. The court said that since Sampo still had the data, it was not stolen.

Contractors must say 'no'

Vendors seeking U.S. government contracts valued at \$25,000 or more must certify that they will maintain a drug-free workplace, according to a governmentwide regulation issued last week. Contractors must establish drug-free workplace policies, notify the government of any employee convicted of a drug crime and impose sanctions. The regulation pertains to all types of contracts — including those for computer hardware, software and services — awarded on or after March 18.

Long-line rates keep falling

Continuing the domino effect brought on by AT&T's series of rate cuts last year, MCI Communications Corp. slashed its Terrestrial Digital Services (TDS) rates last week. For a typical 300-mile circuit, users of MCI's 1.5M bit/sec. T1 service will see a 26% rate reduction, while the 45M bit/sec. TDS 45 rate will be reduced by 9%, MCI said. The tariffs, which are already in effect, "put us in the competitive arena with AT&T," an MCI spokesman said. He refused to comment on U.S. Sprint Communications Co.'s recent reduction of as much as 48% off its T1 service. Also last week, MCI expanded the range of its TDS 45 service from just three Southern cities to 40 cities nationwide. In addition, the company announced a multiyear, multimillion-dollar contract to provide a high-speed international data network to Cray Research, Inc.

9370 and Token-Ring head east

The first shipments of IBM 9370s and Token-Ring networks may soon find their way into the Hungarian computer market. Officials of IBM's Hungarian affiliate — IBM Magyarorszag Kft. — recently said businesses in the Eastern European country will be able to acquire Token-Ring products and those 9370s that fall within the performance guidelines set by the multinational Coordinating Committee on Multilateral Export Controls, frequently known as COCOM.

Former defense chief elected

Frank C. Carlucci, former U.S. secretary of defense, surfaced in the communications world last week when he was appointed to the board of directors of Bell Atlantic Corp. Carlucci, who served in government posts for four U.S. presidents, also is a director of Ashland Oil Corp. and Westinghouse Electric Co. Others recently appointed to the Bell Atlantic board are James Howard Gilliam Jr., senior vice-president of Beneficial Corp., and Bell Atlantic general counsel Robert A. Levetown.

Apple graded A-1

Apple Computer, Inc.'s commercial paper program received an A-1 rating — just below the top mark of A-1 plus — from Standard & Poor's Corp. last week. The high mark was issued during the week following Apple's own projections of continued but slower profit growth. The grade was based on the company's strong profit margins, lack of competition from clone makers and its successful transition from the education market to the business market, said Standard & Poor's analyst Martin Knoblowitz. The rating also reflects the risk that competitive pressure from IBM and IBM-compatible systems that make use of OS/2 will cut into Apple's sales, Knoblowitz said.

Recast Mac II in the works

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. is expected to introduce a slimmed-down, more powerful version of the Macintosh II in early March at Hannover Faire CeBIT '89, the massive annual European technology exposition.

According to sources, the new Mac — called the Macintosh IICX — will be a three-slot version of the Mac II, half the slots available on other Mac II models. As a result, the base of the Mac IICX is smaller than previous versions of the Mac II, sources who have seen the system said.

Apple officials declined to comment on the new system.

Sources said the machine will be powered by a Motorola, Inc. 68030 microprocessor — used in the Mac IIX introduced last

September and the recently introduced Mac SE/30 — running at a clock speed of 15.7 MHz. In addition, it will offer 2M bytes of random-access memory and a choice of a 40M- or 80M-byte hard disk drive.

Mac II replacement?

The new system will likely replace the Motorola 68020-based Mac II with Apple's business users, said corporate customers who asked not to be identified. Apple said it would like to standardize on the 68030, which offers a better platform for a multitasking version of the Mac operating system, expected to be released later this year.

It may literally replace the Mac II as the entry-level model in that line. Industry watchers said they expect the Mac II, introduced in 1987, to be phased out by year's end.

The Mac IICX "has got a nice

footprint," one corporate customer said. "For the corporation, it really is the answer. You need the 68030 for multitasking, and very seldom do you use more than three expansion slots."

"How exciting this product will be will depend on the pricing," another corporate customer said.

The Mac IICX will also feature Apple's Superdrive, a 1.4M-byte, high-density floppy drive that can read, write and format Microsoft Corp. MS-DOS and OS/2 disks. If Mac users use it with the Apple File Exchange utility, they can access and transfer MS-DOS and OS/2 files.

Pricing of the system remains undisclosed.

Apple opted to introduce the new Mac at the Hannover Faire to demonstrate its commitment to the European market, sources said.

DEC-Apple

FROM PAGE 1

tal," Newman continued. "We wanted one-stop shopping, and we aren't getting it."

User complaints are myriad. Since Apple and DEC's strategic alliance was forged in early 1988, neither company has introduced Mac-to-VAX connectivity products. Longtime DEC customers have been left to sort through a long list of third-party products with little guidance from either DEC or Apple. DEC, especially, has been reticent to endorse certain third-party products, they noted.

So far, DEC and Apple have agreed that SQL will be the correct interface between Mac applications and relational databases residing on a VAX. Little more in the way of tangible guidelines have emerged.

Apple officials cautioned that products may not be forthcoming from the alliance, contradicting an expectation held by many users from the original announcement. "We're not going to introduce products, necessarily," an Apple spokeswoman said. Rather, the outcome of the alliance will be better guidelines for third-party product development, she noted.

"We fully expect to continue working to integrate Macs as effectively as possible in a VAX environment," a DEC spokesman said. "What form that takes is still subject to further development." The spokesman added that the companies released a list of specifications for developers at a meeting last August. "We never outlined specific products," he said.

Better development guidelines for third parties are of little

comfort to users who would prefer to buy DEC-created products. "Certain third-party solutions are OK, but others aren't," said Bo Pitzker, associate systems analyst for Pacific Bell in San Francisco. "Even with those that are considered leaders in Mac-to-VAX connectivity, it's been a real zoo story. I'm very cautious."

Also, users say they are tired of waiting. They need guidelines today for connecting Macs to VAXs — solutions that will be as viable tomorrow as they are today.

"I don't care if the local DEC salesman is well-versed and tells me this is good software to integrate my Macs if DEC as a company isn't behind it," said J. Roy Davis, director of systems operations for Hughes Aircraft Co. "There aren't stable standards in this world that allow you to buy any products just because they conform. If I don't have DEC and Apple working third parties and each other, I'm going to be left holding the bag."

Users said they are discouraged by signs that the two companies have drifted apart and that the relationship may never yield anything more concrete. In the year since the announcement, DEC has agreed to act as OEM for MS-DOS-based personal computers from Tandy Corp. with its VAXs and has struck an informal reference selling deal with Compaq Computer Corp. Furthermore, DEC recently introduced its own desktop systems that will compete directly with the high end of Apple's Macintosh line.

For its part, Apple appears to be concentrating on Mac-to-IBM mainframe connectivity, which offers the company a greater marketing opportunity.

Amdahl buys firm for Unix, scalar skills

SUNNYVALE, Calif. — In an unusual move, Amdahl Corp. is acquiring outside technological assistance. The company announced last week that it will buy Key Computer Laboratories, Inc. for its Unix and scalar mainframe expertise.

Amdahl, which usually develops technology in-house, has agreed to trade \$30 million of its stock for the Fremont, Calif.-based company with 60 employees.

"Perhaps Key has an architectural approach that bridges the interactive Unix system designed for minicomputers to the production job approach of scalar mainframes," said Peter Labe, an analyst at New York's Drexel Burnham Lambert, Inc.

With the prospect of a single Unix standard evolving for the 1990s, Amdahl is assigning "a ton" of its employees to Unix research, according to Labe.

Amdahl offers its version of AT&T's Unix System V, UTS, on mainframes.

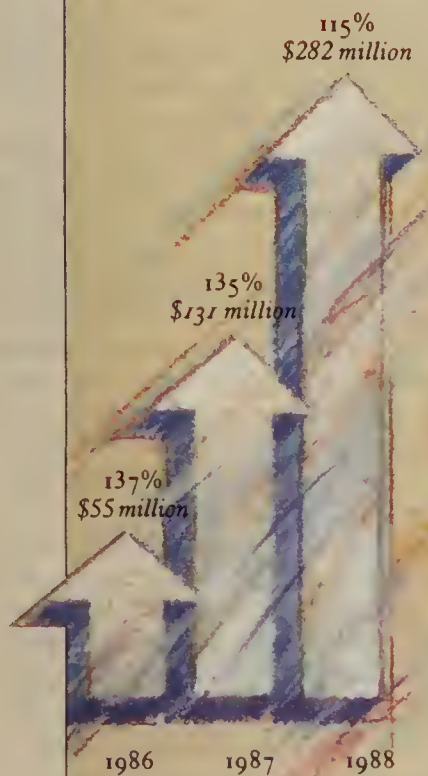
Personnel from Key will reportedly be merged into Amdahl's research and development area, according to Bonnie Digrius, an analyst at Santa Clara, Calif.-based Infocorp.

Amdahl mainframes can also run IBM's version of Unix, AIX, under the VM operating system, but with a performance penalty of 20%, according to Labe.

Officials from Key would not comment on the acquisition by Amdahl.

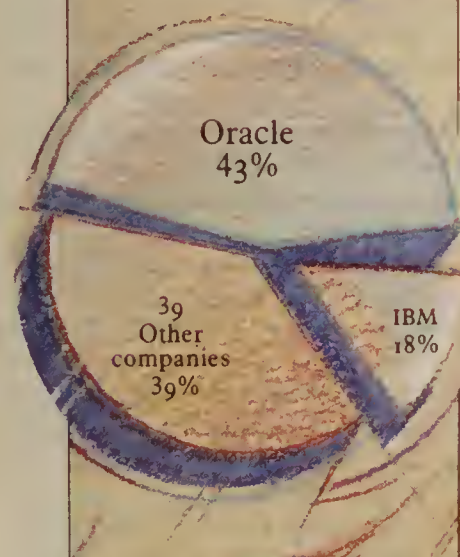
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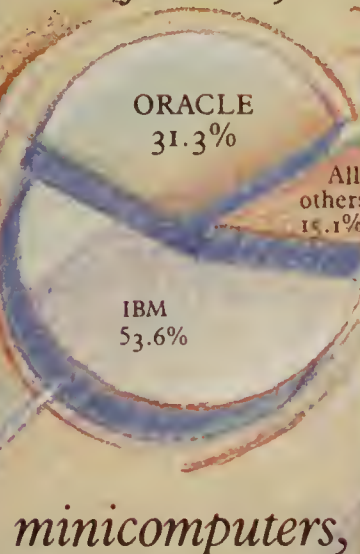
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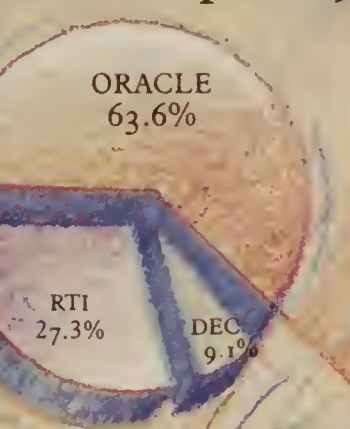


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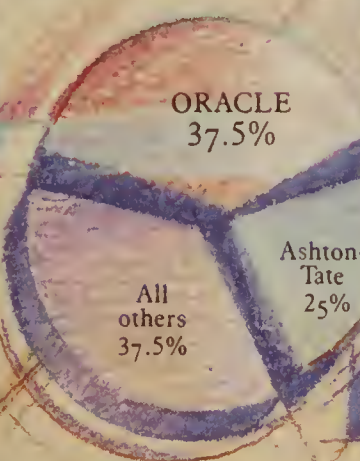
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Options to T1, T3 drive down net costs

BY PATRICIA KEEFE
CW STAFF

WESTBORO, Mass. — A number of users have begun to consider using single-mode fiber optics as a less costly alternative to T1 and T3 services for tying together enterprisewide systems. Users can either run their own services over the cable or opt for a new breed of modems said to enable bypass of the local carriers.

Proteon, Inc. last week introduced a single-mode fiber-optic modem said to do just that while also providing users with a way to integrate multimode and single-

mode fiber into an enterprise network.

Single-mode fiber features an extremely high bandwidth and is optimized for communications over distances greater than 10 km at speeds up to multiple gigahertz.

Priced at \$10,000 each, the P3282 modem extends the reach of Proteon's Pronet-80 80M bit/sec. multimode fiber-optic token-ring network over distances as great as 30 km without repeaters.

The FX8400, a similar product released in November by Hyannis, Mass.-based Fibronics International, Inc., extends distances up to 40 km between

nodes on its 100M bit/sec. Fiber Distributed Data Interface-based network. It costs \$38,000.

These products are targeted for use in metropolitan-area networks or campus environments. Users typically lease 1.544M bit/sec. T1 or 45M bit/sec. T3 lines to connect geographically dispersed sites. The telephone companies charge fees for these services, which involve point-to-point connections routed through the telephone company's central switching facilities.

Users who prefer to maintain their own equipment often just want to obtain

the physical media over which they can provide their own services, said Gregory Koss, a Fibronics product manager.

In one version of this scenario, buildings can be connected on one shared single-mode fiber ring vs. having to install a series of separate, dedicated lines between two points, said Diane Rahe, a Proteon product manager.

Users save money because there is no need to go through the switching center when using these modems, Rahe claimed.

One obstacle is that the telephone companies do not like to supply only the physical media; they prefer to charge on a per-usage basis or by the bandwidth, Koss noted. Yet, it is possible to lease fiber lines from local carriers, Rahe said.

The carriers have circled many major cities with single-mode fiber, much of which has gone unused, according to Proteon and Fibronics. In Los Angeles, for example, the telephone company installed a good deal of single-mode fiber only to find that its intended targets — business voice systems — do not need the bandwidth, said Hal Spurney, Fibronics' director of marketing. "It turns out that it's the data people who need it for enterprise networking," he said.

Still other users such as Boeing Computer Services (BCS) in Seattle are seeking alternative means of obtaining physical links between their sites. Bypassing the local carrier, BCS is in the process of negotiating right-of-way agreements that will enable it to lay its own fiber cable.

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DEC extends its Ethernet support to IBM Type 1

LITTLETON, Mass. — Digital Equipment Corp. last week stretched its IEEE 802.3 Ethernet support to encompass both IBM's shielded twisted-pair cable and the emerging Electronics Industries Association (EIA) building-wiring standard.

At the same time, DEC hauled out the big blade to hack an average of 27.5% — and as much as 45% — off pricing for its bridge products.

In addition, DEC extended its VAX-to-Cray Research, Inc. Cray gateway capabilities to include all VAX 8800, 6200 and 6300 systems, providing users with greater computational power for high-throughput environments. Previously, only the VAX 8250 could link to the Cray supercomputer.

The extended wiring support reportedly enables users of workstations or personal computers linked to shielded twisted-pair to directly access DEC's Ethernet devices in a wiring closet.

This access also allows these users to take advantage of DEC's Decnet/Open Systems Interconnect, VAX/VMS Services for MS-DOS and IBM 3270 terminal emulators without having to rewire their office or building.

Pricing varies for the shielded twisted-pair Ethernet adapter. A \$2,000 starter kit supports eight workstations. Components can be purchased separately for \$200 to \$750.

Citing customer demand and lower product costs, DEC also announced price cuts ranging from 12% to 45% on six bridge products.

COMPANY PROFILE

Dear Mainframe User: We, at Software Engineering of America, have created this letter at the request of a large number of mainframe users. In light of all the turmoil brought about by the current spate of mergers and acquisitions, many of you have told us that you are interested in the plans and intentions of the companies with which you do business. Since one of our main goals is keeping in tune with the concerns of the user community, we are more than willing to comply.

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- To provide first-rate support for those products - 24 hours a day, 7 days a week.

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SEA's DASD/Data Management tools have become corporate standards, used in one out of every five MVS data centers worldwide.

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SEA's approach to development is to keep Product Development Teams together, working on specific products for the long term. We have found that this approach generates a high level of dedication and expertise. We believe that this methodology is the reason SEA has received such consistently high ratings from our users, for technical support and product development.

COMPANY ORGANIZATION

SEA is a privately held company, whose growth over the years has been internally funded by product sales. Our users have indicated that they prefer us to remain independent. This independence guarantees our ability to continue to provide the highest standard of product support and development currently available.

Software Engineering of America is proud to supply the mainframe user community with the above information about our company. We would also like to take the opportunity to express our appreciation for the support that we receive from over 6000 users worldwide. In return, we shall continue to deliver to our users, the highest level of dedication and support available in the industry.

If you are currently not an SEA user, we invite you to take a free, no-obligation trial of our products. We are certain you will find, as thousands of others have, that our products will provide cost-effective solutions to your installation's needs.

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Sears EDI services offered for commercial customers

BY ALAN J. RYAN
CW STAFF

ARLINGTON HEIGHTS, Ill. — A Sears, Roebuck and Co. subsidiary, which for years has been providing proprietary electronic data interchange (EDI) services for trading partners of the Sears Merchandise Group, is now making those services commercially available.

In an interview last week, Gary Weis, president of Sears Communications Co.,

said the EDI services will be marketed to any industry segment that has a requirement in the ANSI X.12 EDI standard world.

Kathryn Korostoff, an EDI analyst at market research firm International Data Corp. in Framingham, Mass., said the Sears announcement does not come as a surprise.

"They already have the network in place, so the incremental cost of offering additional services over the existing net-

work would be relatively low, especially considering the potential to generate revenue," she said.

Lucrative services

Weis declined comment on any potential profits to be gained from the new EDI services, but Korostoff said other companies offering EDI services have found it to be lucrative. For instance, at GE Information Services in Rockville, Md., EDI service accounts for approximately 10% of the group's revenue, she said.

Weis, who is also vice-president of data communications and software services for the newly formed Sears Technology Services, Inc. [CW, Jan. 30], said customers of Sears National Data Exchange Network proprietary EDI services were

briefed late last month in Orlando, Fla., on the new services.

The new service will begin with an 800-member base of users of the proprietary EDI services, Weis said.

The X.12 EDI formats include standard formats for purchase orders, for example, Weis said.

"We had our own proprietary format for a number of years, which we used in exchanging purchase orders with our sources. Now, in addition to supporting the proprietary format, which we will continue to support over time, we are adding support of all the X.12 standard formats," he said.

Weis said new customers will join the service through a team of Sears' EDI specialists in Arlington Heights. The company will soon begin a marketing campaign to attract new customers, he added.

Sears Communications employs more than 400 people. Weis said that the firm has added new positions and that more will likely be added as the business continues to grow.

Chip hoarding pares Apple net

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — There are some mistakes that you just can't run from.

That must be how executives at Apple Computer, Inc. are feeling this month after its widely criticized price hike last summer has come back to haunt it.

An ill-timed decision to stockpile costly memory components last summer has dealt Apple a significant financial setback. Company officials said Apple's revenue for the second quarter ending March 30 is projected between 35 cents and 45 cents per share, a drop from 61 cents per share for the corresponding quarter last year. That places revenue between \$45.5 million and \$58.5 million in the second quarter, compared with \$79.7 million for the same quarter in 1988.

Before this quarter, Apple had experienced 12 consecutive quarters of explosive growth. Apple officials said earnings will recover to "customer levels" in the third and fourth quarters.

It is possible — but not likely — that other personal computer vendors will find themselves in the same predicament. Apple's price increase came significantly later than those of other PC vendors.

Some vendors, such as Compaq Computer Corp., tried to hold the line. Compaq raised the prices of add-in memory kits in July but did not increase its PC prices.

Last summer, Apple stockpiled 1M-byte dynamic random-access memory at premium prices during the worst of the chip shortage. To compensate for the cost of memory components, Apple subsequently raised prices on its memory-intensive Macintosh computers by anywhere from \$400 to \$1,100.

At about the same time, memory prices began to drop, leaving Apple with a surplus of chips purchased at higher prices. Last summer, Apple paid \$38 per memory chip, the spokesman said. The going price for a memory chip now is about \$23. To alter customer buying patterns, Apple reduced prices last month.

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Apollo makes graphics entry

BY JAMES DALY
CW STAFF

CHELMSFORD, Mass. — Apollo Computer, Inc. trotted out its long-promised entry into the year-old graphics supercomputer market last week, vowing

to play catch-up quickly through a design that brings the power of reduced instruction set computing (RISC) to the machine's graphics engine.

Although Silicon Graphics, Inc., Ardent Computer Corp., Stellar Computer, Inc. and Hew-

lett-Packard Co. began shipping functionally similar machines as early as last May, Apollo officials forecast rapid success for the Series 10000 Visualization System, or 10000VS, based on both the RISC engine and immediate inroads in Apollo's extensive in-

stalled base.

"We have the advantage in both technology and corporate profile," Vice-President of Product Marketing and Programs Michael A. Gallup said.

The power of the Series 10000VS stems from Apollo's RISC-based Parallel Reduced Instruction Set Multiprocessor (PRISM) architecture, which was introduced last year with the

Domain Series 10000 Personal Supercomputer [CW, March 7]. The 62-bit design yields an engine that can deliver 15 to 30 million instructions per second (MIPS) with one processor and up to 100 MIPS in a four-processor configuration.

Because of the delay in getting the machine to market, analysts said they feel Apollo has a lot riding on the Series 10000VS.

"It's an important product because Apollo has lost momentum and is not on a lot of people's short lists anymore," said Vicki Brown, an analyst at Framingham, Mass.-based International Data Corp. "If they can sell it, it should improve the firm's profitability because they should get a lot of margins out of this system."

Graphics engine

Apollo's key merchandising point for the machine — which is slated to ship in March — will be a much-touted RISC drawing engine that handles pixel-drawing tasks common to all applications. The graphics engine is tightly integrated with the main RISC CPUs, Apollo officials said, marking a departure from the traditional approach of using an independent rendering pipeline with fixed capabilities.

Analysts viewed the machine as a welcome addition to Apollo's product family. "Although Apollo has a troubled product strategy at its mid-range and low end, this machine is an excellent addition and is now the strongest part of their product line," said Robert G. Herwick, senior technology analyst at San Francisco-based market research firm Hambrecht & Quist, Inc. "Unfortunately, it's at the top of their pyramid, which makes it a smaller market."

Apollo may also face competition from Digital Equipment Corp.'s recently introduced Vaxstation 3520 and 3540 [CW, Jan. 16], which "is DEC's first serious attempt at graphics and should do well in their installed base," Herwick added.

Graphics supercomputers span the gap between high-end workstations and minisupercomputers, sporting exceptional graphics and processing power that cuts through the most computationally intensive jobs.

Apollo said it expects the mechanical computer-aided engineering market to be a prime target for the machine and brought out several software developers that announced support in that area.

An entry-level Series 10000VS configuration with 8M bytes of memory, a 348M-byte disk and a 19-in., 1,280-by-1,024-pixel color display is available with 40 or 80 planes of color. A 40-plane single-processor system begins at \$94,900, while an 80-plane single-processor system starts at \$104,900.

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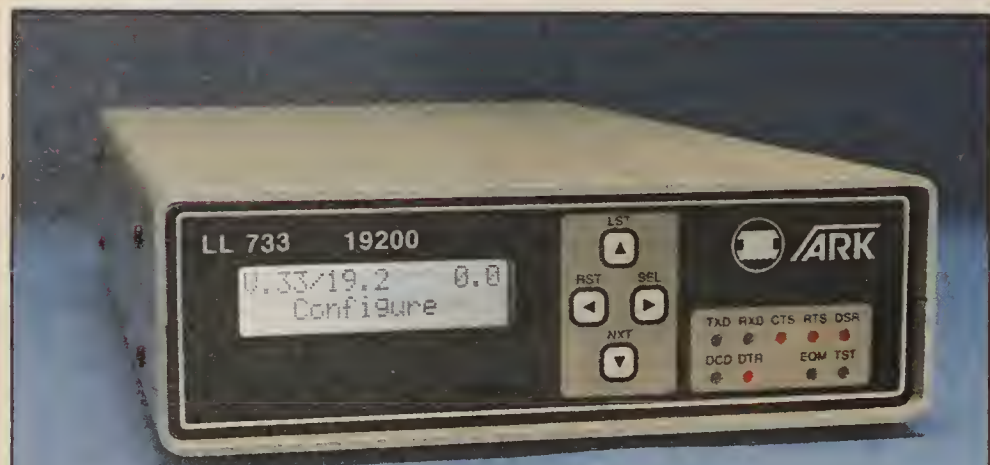
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COMPUTERWORLD

Compaq conquers \$2B mark, while Wyse posts \$26.4M loss

BY NELL MARGOLIS
CW STAFF

HOUSTON — Avid acceptance of its recently announced laptop last week rocketed Compaq Computer Corp. past the \$2 billion mark — the first microcomputer company to enter that rarefied territory since Apple Computer, Inc. planted the flag.

Revenue of \$668 million for the quarter ended Dec. 31 marked a 55% increase

over sales in the corresponding 1987 quarter. Net income for the quarter showed an even larger leap, up 88% to \$92 million.

For the year, Compaq netted a 69% revenue rise to \$2.1 billion. Net income jumped 87% to \$255 million.

"It was an excellent quarter, strong across the board," said Bruce Watts, an analyst at Needham & Co. "It exceeded our expectations." However, he added, it did not exceed historical precedent. "If

you look back through the years," he said, "it's not unusual to see up to 33% of Compaq's sales coming in the fourth quarter."

Laptop, 386 desktops credited

Compaq Chief Executive Officer Rod Canion credited the company's stellar showing largely to the warm market reception accorded to products that debuted in 1988: three Intel Corp. 80386-based desktop models and the Compaq SLT/286, a 14-pound 12-MHz laptop.

"Extremely high-quality products, a reputation for reliability and an exceptionally good relationship with its distribution channel" have kept Compaq at the forefront of the microcomputer market, Watts claimed. Perhaps even more significant, he said, has been the company's

consistent regard for timeliness.

"They made a decision early in the game: If you make timely announcements of new technology and ship the same day, you're going to do very well," Watts said. "And it's worked out just that way."

Meanwhile, a \$26.4 million loss posted by San Jose, Calif.-based Wyse Technology served as a sharp reminder that the microcomputer sector is not an endless sunny side of the street. The company reported a quarterly revenue of \$65.5 million, a 49% drop from revenue for last year's corresponding period.

Wyse laid the loss at the door of falling revenue, steep price reductions announced in December, changes in inventory valuation and the high cost of restructuring operations.

Stanford scraps racist-labeled Unix joke service

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — A Unix news service offering jokes — some of which had racial and sexual overtones — was taken away from Stanford University's academic users late last month amid cries of censorship.

"Some jokes were extremely offensive and were also extremely funny," said Joel Shurkin, a Stanford spokesman. He added that the university has been particularly sensitive about racial tension on campus in recent months.

Jokes in the file that were potentially offensive were labeled as such. The file was reportedly developed by a Waterloo, Ontario, software consultant; attempts to contact the consultant by press time were unsuccessful.

A call to restore file

John McCarthy, a Stanford professor of computer science, is asking the university to restore the file, based on "the tradition of academic freedom." McCarthy said he had 90 signatures on an electronic petition as of last week.

Currently, if a Usenet user attempts to access the joke file, the file itself will not appear. Instead, there is a message from Ralph Gorin, director of academic information resources at Stanford, that reads in part, "Jokes based on such stereotypes perpetuate racism, sexism and intolerance."

Gorin refused to comment but said in a university-released statement that he did not feel his actions constituted censorship, that receiving the service was like receiving a magazine unsolicited in the mail and that he "simply decided not to subscribe."

Cliff Johnson, manager of capacity planning at the Stanford Data Center, added that the joke file "wasted resources."

"That's malarkey," McCarthy said. "There are 500 news groups; they removed one."

The furor was reportedly kicked off last year by a student from MIT who lodged a protest about an ethnic joke to the service's creator in Waterloo, according to McCarthy.

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How smart planners have turned the Bell break-up into a significant strategic advantage:

AT&T price caps vote held until March

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Dennis Patrick put AT&T on hold last week while the Federal Communications Commission chairman attempts to make peace with Democratic legislators who are skeptical of his plan to replace AT&T's current profit ceilings with a "price caps" regulation.

Patrick postponed the FCC vote on price caps that was scheduled for last week to March 16 "as an accommodation to members of Congress who have re-

quested an additional opportunity to study and debate the proposal before it is voted," he said.

AT&T said it was disappointed as well as frustrated by the delay because price caps regulation has been under consideration for more than two years. The plan would effectively replace the current method of regulating AT&T — a 12.2% ceiling on the carrier's rate of return — with a complicated form of price controls for "baskets" of related services [CW, May 16, 1988].

U.S. Rep. Edward J. Markey (D-Mass.), chairman of the House Subcom-

mittee on Telecommunications and Finance, called the delay of the vote "a constructive step" and said that hearings will be held late this month.

Flimsy case

Markey and other skeptics have argued that the FCC has failed to make a solid case for revamping the decades-old system of regulating AT&T. But according to George R. Dellinger, telecommunications analyst at Washington Analysis Corp., "About 95% of this [dispute] is partisan politics and egos, and 5% is substance."

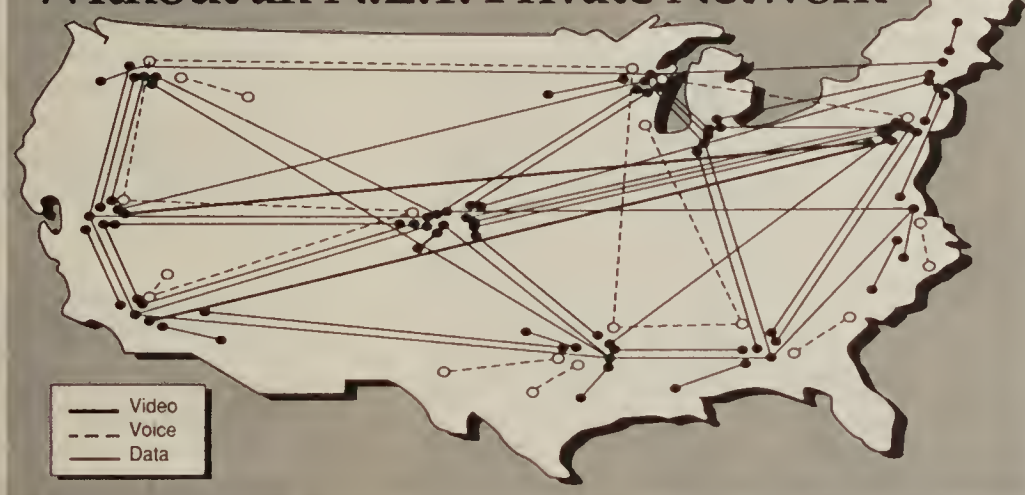
Mostly, Patrick needs to patch up his strained relations with the Democratic-controlled Congress, Dellinger said. Price caps is a pet project for the Republican FCC chairman, who said it will give AT&T an incentive to cut costs and become more efficient.

The price caps proposal would freeze current rates and then adjust the aggregate price ceiling annually to reflect the inflation rate minus 3%. Individual services would be subject to a price band, allowing them to rise or fall no more than 5% a year.

Business network associations have complained that the proposal starts with current rates that are inflated and fails to provide major price cuts for users [CW, Aug. 1, 1988].

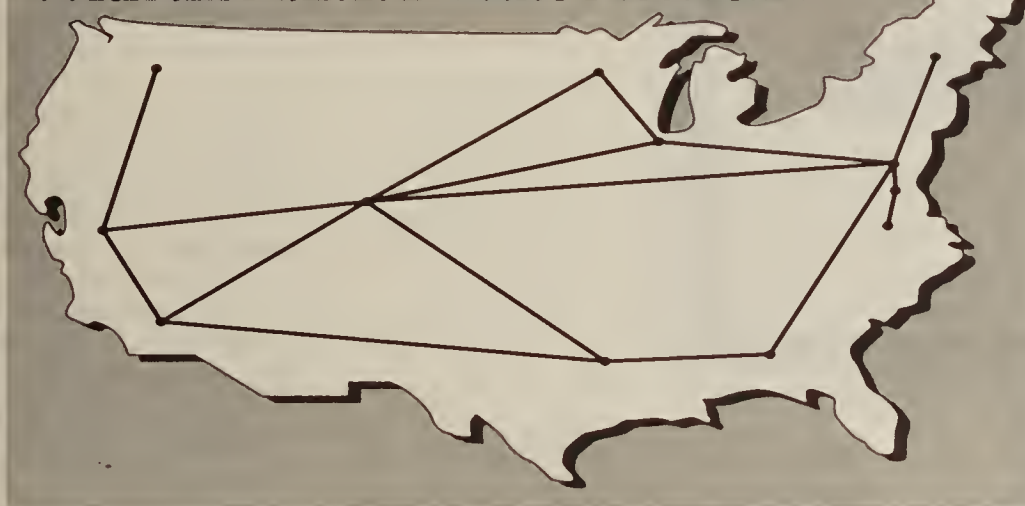
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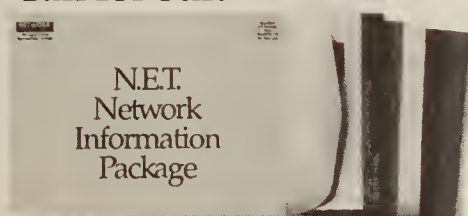
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Airlines pick Cincom for global net

BY PATRICIA KEEFE
CW STAFF

CINCINNATI — Galileo, a consortium consisting of 10 international airlines, has chosen Cincom Systems, Inc.'s Net/Master network management software as part of its effort to launch a global network capable of handling up to 1,000 transaction/sec. by 1990.

Net/Master reportedly was chosen over three competitors' products — IBM's Netview, Computer Associates International, Inc.'s Netman and Peregrine Systems, Inc.'s PNMS3 — for its ability to integrate problem change management with operational control. It will be used to manage Galileo's IBM Systems Network Architecture network.

"We chose Net/Master for its ability to deal with . . . a highly distributed and very unpredictable environment. We were looking for the most flexible tool . . . to cope with the network and site management," said Jerry Krause, vice-president of technical services at Galileo and a Covia Corp. employee.

Ten copies

Galileo is purchasing 10 copies of Net/Master and Info/Master — Cincom's processing shell for defining applications to support network and systems-related data — for the network, which is scheduled to go on-line in August.

Net/Master will be installed at Galileo's new switching center located in Swindon, England. By August, the center will hold six IBM 3090 Model 280 mainframes linked to more than 9,000 IBM Personal System/2 Model 50s located in thousands of travel agencies throughout Europe. A central database will manage more than 33 million fares and is expected to grow by 20% each year.

All airline inquiries and reservations will be switched through the Galileo Data Center, with links to each airline's own IBM installation in major cities, Cincom said.

The 10 member airlines are Aer Lingus, Alitalia Airlines, Austrian Airways, British Airways, KLM, Olympic Airways, Sabena, Swissair, TAP Air Portugal and Covia.

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American/Delta plan likely to get government review

BY ALAN J. RYAN
CW STAFF

DALLAS — While two airlines were in the midst of discussions to establish an independent computer reservation system last week, a U.S. Justice Department spokesman said his office would likely look into any such combined system to be certain it violates no antitrust laws.

American Airlines, which announced that the talks were under way, would not

comment on details of the negotiations. The company did say that the independent reservation system for use by travel agents would combine the resources of American's and Delta Air Line's systems, called Sabre and Datas II, respectively.

American's Sabre is reportedly the largest of any of the reservation systems, with a 35% market share in travel agencies [CW, June 13, 1988]. Delta's Datas II was listed as the fifth largest system by *Travel Weekly* in 1987.

If combined, each airline would own 50% of the system, and the system would be operated as an autonomous company. Additionally, the parties would possibly offer interests in the new system to others, including domestic and international air carriers, according to information released by American.

An official at the Department of Justice said there was no investigation of the potential system now but added, "That would be the kind of transaction we would look into."

The U.S. government has been studying airline computerized reservation systems more closely since 1984, when the Civil Aeronautics Board required the airlines to create systems that would not display bias for any particular airline.

Previous to that decision, the airline that provided the reservation system to the agent would typically list all of its flights above its competitors on the screen, which created bias, according to the study.

Financial encouragement

Still, according to a 1988 study by the U.S. Department of Transportation, travel agents using the airline reservation systems may give preferential treatment to the airline that provides the system because the airline may include financial inducements for them to do so.

A spokeswoman at United Airlines, whose Apollo reservation system would likely feel a negative impact if the American/Delta talks are fruitful, would not comment on the issue. She also declined comment on whether United would contemplate filing a complaint of unfair competition against the airlines if the system is put into place.

In its statement, American said it had previously engaged in discussions with others concerning joint reservation system activity but that none of the discussions resulted in an agreement. Therefore, the airline said, there can be no assurance that the proposed transaction with Delta could be accomplished on mutually agreeable terms.

CW Washington, D.C., Bureau Chief Mitch Betts contributed to this article.

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Unisys adds Unix system; lineup now totals five

Apparently, Unisys Corp. believes a company can't have too many Unix systems.

Last week, it added a fifth Unix-based line to its product array when it announced a deal with Sequent Computer Systems, Inc. However, a Unisys spokesman said the company was unable to explain where the Sequent box — a Unix-based parallel computer — will fit into its overall Unix strategy.

Unisys also sells low-end Unix systems from NCR Corp., as well as an assortment of mid-range and high-end systems from Arix Corp. and Computer Consoles, Inc. In addition, Unisys offers its own Unix systems, which are actually based on those of Convergent Technologies, Inc., which it acquired last year.

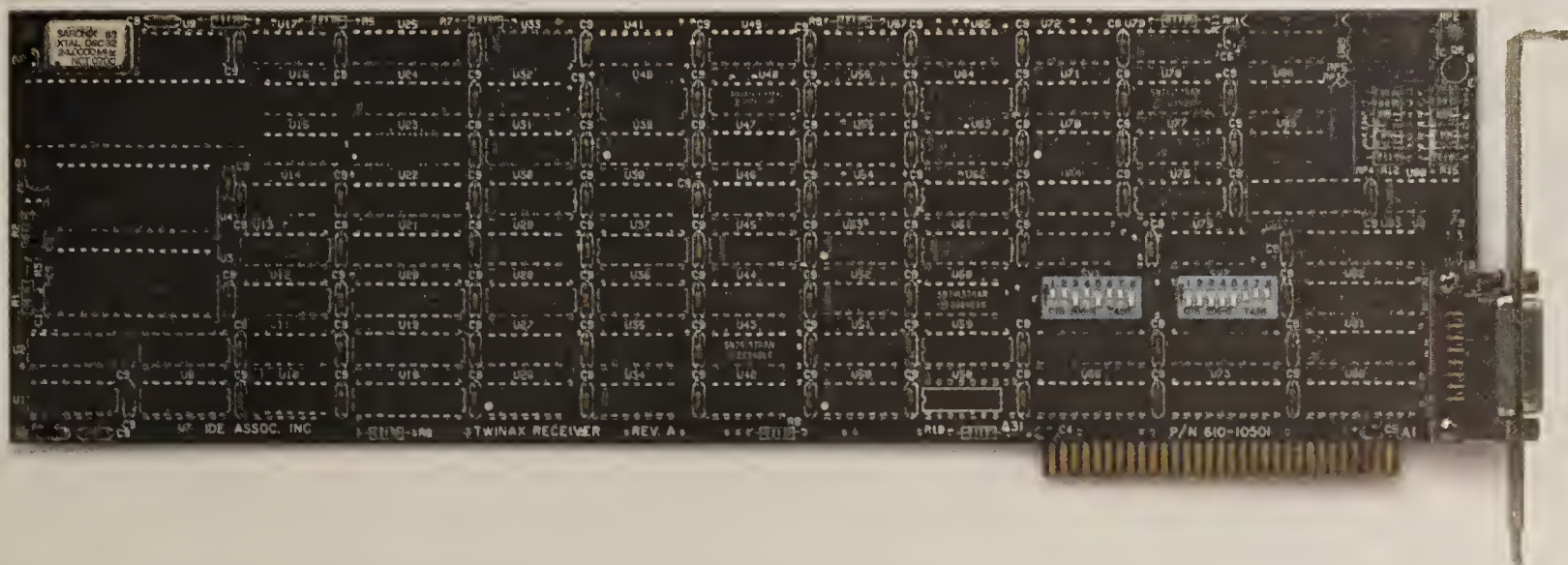
Sit in the dark

A Unisys spokesman said last week's announcement was strictly a release from Sequent. The company, he said, was not planning to shed light on its Unix products at this time.

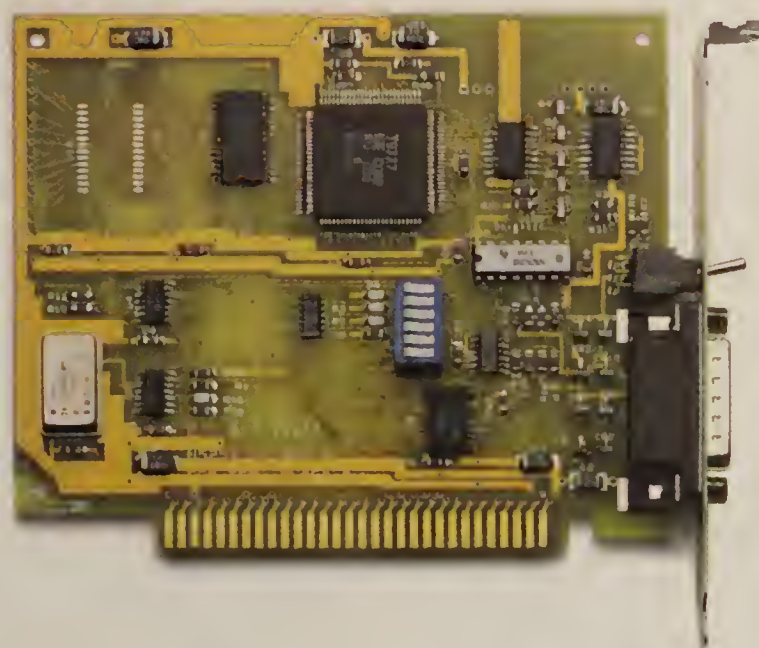
Instead, it has scheduled a big Unix announcement Feb. 21 and will outline its Unix plans and give details on the latest addition at that time.

Sequent, however, had plenty to say. It said the deal, which is a three-year contract that could be expanded to five years, could represent more than \$250 million in revenue. The company said it expects to make \$10 million in the first year, a sizable chunk for a company that reported \$76 million in revenue last year.

Sequent also said that Unisys is expected to begin shipping a system based on the Sequent computer by mid-1989.



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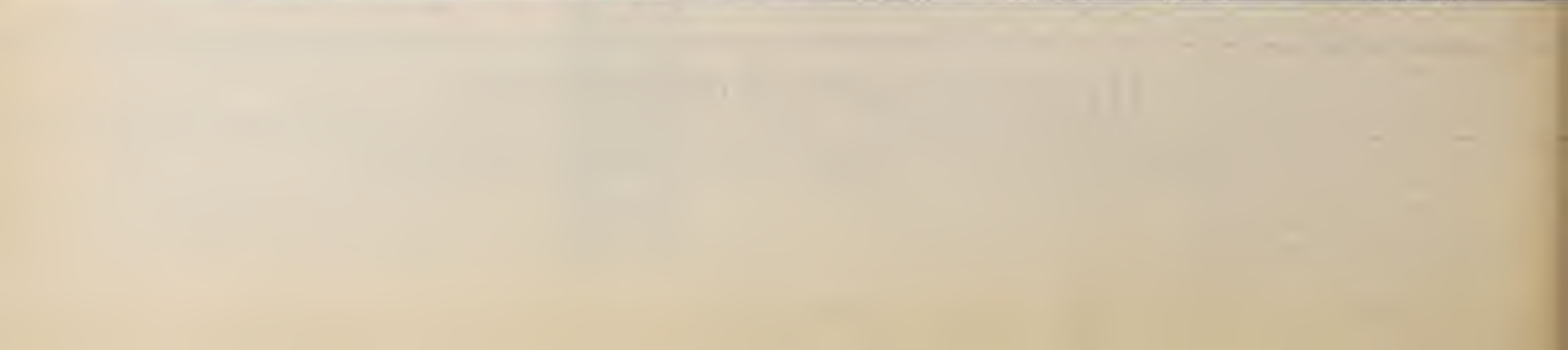
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EDITORIAL

Re-Groupeing

JOHN IMLAY, CHAIRMAN of Management Science America and venerable toastmaster of the computer industry, used to kid audiences by announcing the (fictitious) amalgamation of Fairchild Semiconductor and Honeywell. The new firm? Farewell Honeychild, of course.

Last week, Honeywell did effectively fade away from the commercial computer market — in name, that is — and was recast as Bull H. N. Information Systems, one of two noncontiguous parts of the \$5 billion, Paris-based Groupe Bull.

To longtime Honeywell watchers and customers, this is about the umpteenth iteration in company structure since Honeywell bought General Electric's flagging computer business 19 years ago. So, nothing new here; business as usual.

Or is it?

In the public unveiling of the company, Groupe Bull executives gushed about the benefits that a truly global company, one fixing its product lines to prevailing and emerging standards, would provide to customers.

That kind of claim might not necessarily be all bull. The parent company is committing more than 10% of revenue to research and development — much of that earmarked for Groupe Bull's U.S. thrust.

Furthermore, some unique benefits could be derived from the joint Franco-Japanese-U.S. tripartite ownership of Bull H. N. The continued, simultaneous development of the GCOS operating system in disparate countries could yield a sort of "Esperanto" to ensure more seamless computer communications across international borders in the future.

But just how committed is this global company to the U.S. market? Unlike big U.S. players, Groupe Bull does not derive a majority of its revenue from the U.S., and a good portion of what is generated here comes from the lucrative federal market.

While Groupe Bull has made strong pronouncements of its commitment to the U.S. market, privately it speaks of Honeywell as almost a bad word, fearing the company's reputation here is something to be put behind it once and for all.

That's a little curious, because Honeywell was able to make some significant strides in the mid-1980s with its installed mainframe base. In fact, in the Datapro Research annual survey of user satisfaction in 1987, Honeywell — the perennial cellar-dweller in the Datapro rankings of the early 1980s — actually came out on top of the mainframe heap.

Also, some questions remain about the appropriateness of some of Groupe Bull's strategies in the U.S. market. Do users in on-line transaction processing environments really want Unix as badly as Groupe Bull wants to deliver it to them?

What's right for Europe may not be right for the U.S. market, and Europe is the big market for Groupe Bull. This is not to suggest that this unique company can't satisfy customers on three continents. It just has to work that much harder to do so.



LETTERS TO THE EDITOR

Design-first proof

Regarding Gopal Kapur's Reader's Platform [CW, Dec. 5], American Management Systems has been using the design-first strategy for over 12 years to develop information systems for commercial and government clients. Our success with this method is proof of its capability.

For example, in developing a custom financial management system for a large city, we based the design on the pattern inherent in financial transactions — a header followed by a set of identically formatted detail lines. Common functions were implemented in table-driven foundation software, and the individual transaction programs had a standard control structure.

This design approach has been applied to similar systems for a variety of firms. Although the functional details are unique to each application, the pattern and the software architecture that implements it are invariant.

AMS has been applying these practices on large systems for over a decade. Although these practices may be well-known to some, it is clear that many are not aware of them. We wrote our article to share our experience, stimulate others to learn more about it and, ideally, help them achieve greater success.

Fred L. Forman
Executive Vice-President
Milton S. Hess
Vice-President
American Management
Systems, Inc.
Arlington, Va.

of Edward R. Tufte's *The Visual Display of Quantitative Information* to help rid you of misleading graphics and your irritating propensity to represent one- and two-dimensional data in three dimensions.

Also, I called Apple about the 20-MHz Macintosh Pluses and SEs listed in the BoCoEx index on used computers in the back of *Computerworld*. Apparently, they don't make them. I guess I'll have to settle for my 8-MHz SE with a 20M-byte drive.

Chuck Lundgren
Iris Software, Inc.
Chicago

Real value

Douglas Barney defines "pure value" in a microcomputer [CW, Dec. 19] as solely the cost of the hardware, and then continues to vent his anger over the cost of an Apple Macintosh by berating the hardware's high price.

The measure of "pure value" is the total value of the package. What are the total costs of ownership and operation?

IBM uses this argument to defend higher prices for some of its mainframes — and the point is valid. Has the productivity of PCs advanced to a state where hardware price is the valid measure of pure value? If so, you had better find another job, as the rest of us can learn all we need to know in the commodity market news or the BoCoEx index.

Jack G. F. Hill
President
Applied Software Consulting
Brentwood, Tenn.

shortage of "good people," as a DP management professional, I must protest that the reported shortage is not of "good people" but of ready-made highly specific skill sets.

As a 20-year DP veteran who has never assumed a new position with an already-complete skill set, I wonder how and when we arrived at this commodity view of our people (and of ourselves).

I suggest that what confronts us is not a shortage, but a learning-curve delay, which is to be expected in a field as dynamic as this one. I also suggest that we can afford the delay better than we can afford the underemployment of talent and the high turnover and frantic recruiting that results from our current misdirected hiring practices.

We will thwart our own progress if we refuse to rethink our attitudes and if we continue to undervalue the "good people" whose backgrounds, while not fitting our narrowly defined, immediate-need profile, feature aptitude, adaptability and a good set of foundation skills on which to build.

Certainly my personal situation would be more comfortable if I were not regularly confronted by well-meaning friends eager to show me the latest shortage article and clearly puzzled that my current job search is not trivially simple.

Jean Causey
Baltimore

Another gift

I'd like to add to your holiday gift list [CW, Dec. 19]:

For *Computerworld*: A copy

Learning delay

Regarding "Staking out systems integration" [CW, Dec. 12], which features declarations of a

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Conituate Road, Framingham, Mass. 01701.

MIS' future lies down a branching path

DALE KUTNICK



One profound change that will occur in the information processing industry during the next five years will be the rapidly evolving roles of the MIS department.

The tumultuous 1980s have left the traditional management information systems charter far behind. The new MIS role increasingly will be delineated between a business-oriented and technical/service focus.

Driving forces in the 1990s will include the management of highly distributed end-user computing resources (the cumulative installed MIPS on desk tops will be 1,000 times greater than those on minis and mainframes early in the next decade); the design and management of more complex and mission-critical networks; and the increasing necessity of hiding the complexity of systems and architectures from users.

Simultaneously, the information demands of clients and suppliers will escalate, information systems spending as a percentage of capital outlays must be managed and IS must be designed to exploit information resources as a strategic weapon.

CIO uprising

On the business side, the emergence of the chief information officer — in function if not name — will set the career path for business-school bred, finance-experienced or "New Age" MIS vice-presidents. This CIO will take his place in the corporate executive hierarchy, setting strategies, architectures, interfaces and asset management priorities for his company's information resources.

On the technical side, there will be at least two logical divisions, both probably but not necessarily reporting to the CIO.

The first division, data center/systems administration services, will focus on operations and management of physical systems and information resources. The duties could include administering large CPU complexes and networks and overseeing and coordinating database management systems software, data distribution, integrity and synchronization. This job, which can be broken further into two or three separate functional areas, is basically an extension of current MIS responsibilities.

Kutnick is a data processing and communications consultant based in Redding, Conn.

The second division, systems integration services (SIS), will focus on bringing distributed personal computers, local-area networks, servers and heterogeneous (application-optimized) systems into the corporate information infrastructure — with all the incumbent support requirements. This role is a broad expansion of the "information center" concept popularized in the early 1980s.

This job, too, could be broken into two or three functional areas, particularly if it includes facilitating electronic information exchanges — such as electronic data interchange — with clients, suppliers, customers and the like.

Both of these technical groups will enforce and implement the architectures and interfaces established by the more business-oriented CIO side as they relate to end users.

Feedback loop

Ideally, these groups will establish a strong feedback loop to set standards based on both corporate as well as end-user requirements.

For example, while IBM's Systems Application Architecture is a good planning blueprint for a primarily IBM environment, users must develop their own strategic interfaces. These interfaces will allow consistent user and programmer access and incorporate other systems users work with — such as Digital Equipment Corp.'s VAX/VMS and Unix — or would like to employ in their future.

Consistent architectures and interfaces are critical to enabling the systems administration services group to create appropriate network management, data access and administration service standards in a rapidly decentralizing, distributed computing world. The future data center will become the focal point for these activities, as application development and more application execution move outboard.

Pocket problems

Again, data integrity, security, synchronization and coordination will become significantly more difficult as the distributed intelligence "revolution" engenders poorly managed information pockets — such as on PCs and LANs — throughout the organization.

Indeed, one of the major focal points for the SIS department will be the LAN server and LANs themselves. Most of these systems and their software are currently acquired by end users or their departments through

Continued on page 24

That which does not kill me . . .

WILLIAM D. HARRISON



One of the most ineffective MIS managers that I ever worked with was named Joe.

Joe had a particular talent for hiring and promoting people with the ability to report problems in a pleasant way — or not to report them at all.

No matter how late the project or how serious the problem, Joe's staff spared him the bad news. If he asked — which he did frequently, since he was conditioned to expect no problems — they assured him that all systems and projects were running smoothly.

It is not as if Joe's staff did not have problems to talk about. There was the time the tape librarian released an obsolete parts information file for use with the bill-of-materials parts-procurement system.

Then there was the day that a malfunction in the work-in-process data-gathering system ground the company's assembly lines to a standstill.

Joe was not told about these systems problems. His staff took it upon themselves to find the solutions. Joe did not understand the seriousness of either incident until it was explained to him — by the vice-president of manufacturing.

Harrison is an engineering manager at Siemens Information Systems, Inc. in Boca Raton, Fla.

Joe's problem-solving abilities were actually very good, but he never got a chance to use them. According to his staff, there were never any problems to solve. Thus Joe avoided many conflict situations, at least until someone outside his department brought them to his attention. Eventually his success at avoiding involvement in major problems cost him his job. The fiasco caused by the new order-entry system was the last straw for the vice-president of manufacturing.

Autopsy results

After Joe had brought the difficulties under control, the chief of manufacturing ordered a post-mortem analysis. This management review revealed that the disaster could have been averted — if Joe had taken action sooner.

But Joe was avoiding action

by avoiding seeing the problems. He never understood that confrontations and conflict are as normal a part of business as they are of life. Sometimes even the best of people do things incorrectly or do the wrong things, and they must be told of their error. Sometimes even the best of systems fail, and their logic and purpose need rethinking.

Telling a person that he has done something incorrectly produces a certain amount of stress and conflict. But unless an employee is informed about his mistakes, he never has the opportunity to improve and do it right the next time. Joe simply avoided the messy situations in which blame might have had to be assessed. In so doing, of course, he avoided responsibility.

The positive aspects of dis-

Continued on page 24



CATHIE BLECK

Languages may be cure for the common code

MICHAEL B. COHN



I think someone is missing the boat. We spend millions of dollars on new computer languages. Code generators. Source optimizers. Report writers. But even with all these advances and tools, we still seem to make the same coding mistakes we made 20 years ago — except that now we can make them a lot faster.

We need smarter computer languages. Languages that don't get hung up on syntax or unbalanced parentheses or upside-down diskettes. Commands that understand we weren't really trying to divide the monthly

Cohn is a quality assurance representative based in Atlanta.

gross revenue by the word "Nebraska" and have brains enough to go read another record or at least keep it quiet until someone shows up in the morning.

We're pretty good at simplifying the names of computer languages; I understand some of them are down to just one letter. So why doesn't someone invent a language that uses simple abbreviations to do the things coders do with pages of code?

I've already given somebody a head start by listing some of the most needed instructions and abbreviations below:

- DWIM-NWIT: Do What I Meant, Not What I Typed.
- WWWTW: Work the Way We Think it Works.
- WUMP: Work Until it's Moved into Production.
- PUTM: Perform Until Tomorrow Morning.
- PUIGIT: Perform Until I Get

In Trouble.

- PUTFT: Perform Until They Find the Tape.
- MANTWO: Make A Noise To Wake Operator.
- D-JAM: Delete the Jobs Ahead of Mine.
- NT-PAP: Next Time, Please Align the Paper.
- EWIOV: Execute Without Incident Or Variation.
- EWIOV: Explode While I'm On Vacation.
- Abend(IAP): Abend In Another Program.
- Abend(WNL): Abend When Nobody's Looking.
- D-Abend(ALTA): Don't Abend, And Let's Try Again.
- MLK: Mysteriously Lock up Keyboard.
- ULISSI: Un-Lock It when Somebody Shakes It.
- FAST-W: Find A Subroutine That Works.
- UFWY: Use the File that Worked Yesterday.
- MWAT: Make this Work Again Tomorrow.
- SFOC: Someone Figure Out this Code.
- PACOMR: Print A Copy Of My Resume.

Harrison

CONTINUED FROM PAGE 23

agreements and confrontations can be seen in all areas of a data processing department, including strategic planning or meeting with a user to discuss his system requirements.

Design and code reviews are successful because people take the time to point out errors made by others. If a design review does not produce an error action list, it probably indicates that the right questions were not asked.

The role of the end user in reviewing software documentation is not to tell the software department that it has done a fantastic job. The end user must play the

THE CONFLICTS and confrontations that most of us would like to avoid are essential to achieving the level of excellence in performance we desire for departments and individuals alike.

role of inquisitor, or there is a great danger that the wrong product will be built.

If everyone is pleased with the first review of MIS' strategic plan, the department may be on very shaky ground. A

good strategic plan is one that survives a review by a management gauntlet determined to tear it apart.

One of the most effective MIS managers that I worked with had the ability to ask questions that rivaled the Spanish Inquisition for effectiveness. Whenever anyone challenged his plans, he interrogated the questioner relentlessly to determine whether he had facts to back up his opinions. This manager also always thanked the person.

The conflicts and confrontations that most of us would like to avoid are essential to achieving the level of excellence in performance we desire for departments and individuals alike. Perhaps Nietzsche was right — "That which does not kill me will make me stronger."

Kutnick

CONTINUED FROM PAGE 23

various retail channels.

But with the sharply increasing sophistication at the server level, it is unlikely that any of these channels can support the future needs of users or their organizations without their becoming systems integrators, which is not likely.

The future servers' communications requirements alone are far beyond their purview, as is implementation of distributed DBMSs with security and data integrity.

Most retailers do not have the resources or expertise to play this game seriously, and it is unlikely that MIS departments will trust their data or networks to them.

While there are already some outside companies — value-added resellers, OEMs, traditional mini and mainframe vendors, service bureaus and so on — providing these services, the SIS organization must coordinate these activities to keep consistency.

Indeed, end users will abdicate operational and administrative control of their LANs and servers to MIS or SIS in exchange for service, support and transparent resource access. In other words, MIS/SIS becomes the systems integrator for the organization.

So, MIS must evolve in two clear directions. The first is toward the executive-level role, which is more attuned to the organization's business and IS strategy and architecture that drive the future business.

The second is toward the more technical role — implementing the vision by integrating the cornucopia of products and systems within budget and other tactical constraints. This job will require tremendous management skills and patience to deal with end users because it is basically creating a professional service organization.

The business schools will provide the fodder for the first role. It will be the second one that will be more challenging.

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BOOKS IN BRIEF

EDI: The Competitive Edge

By Phyllis K. Sokol

This guide to the opportunities of corporatewide electronic data interchange covers implementation, case studies and cost/benefit analysis.

Hardcover, 346 pages, \$24.95, ISBN 0-07-059511-9, by Intertext Publications, Inc., New York.

Who's Afraid of Big Blue?

By Regis McKenna

A look at the new computing world, where IBM is being challenged not yet in revenue or profit but certainly in innovation and development of new markets.

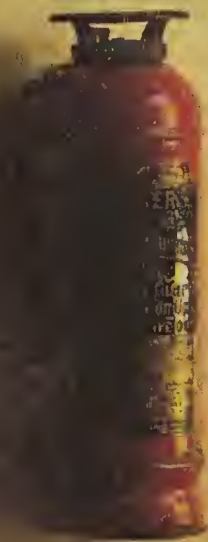
Hardcover, 218 pages, \$17.95, ISBN 0-201-15574-5, by Addison-Wesley Publishing Co., Reading, Mass.

The CD-ROM Handbook

Edited by Chris Sherman

The perspectives of more than 20 experts on the CD-ROM environment, including artificial intelligence, local-area networks, integration and more.

Hardcover, 510 pages, \$59.95, ISBN 0-07-056578-3, by McGraw-Hill Book Co., New York.



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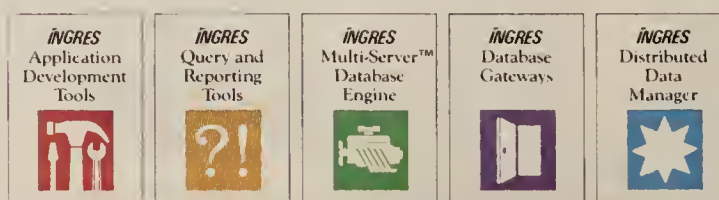
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S O F T T A L K

Stanley Gibson

Cincom slips IBM tackle



The first reaction of some Cincom users to the company's recent announcement of Version 2 of Supra RDBMS was very similar to how a confused football team would respond to a double-reverse by the opposition.

By including SQL in Version 2, Cincom made it necessary for users of Version 1, which does not include SQL, to convert their software to fully migrate. Although Cincom said it would make it possible for a user to move to Version 2 without using SQL, users contacted did not express interest in this option.

One user was still in the midst of the lengthy process of converting from Cincom's earlier database management system Total to Supra Version 1. The last thing he wanted was yet another conversion. With Version 1 not fully implemented, he said he thought that bailing out and going with IBM's DB2 might be preferable to trying to out-guess Cincom's game plan.

Few users contacted at random said they would move to implement SQL in the near future because they had no appetite for an arduous conversion.

Continued on page 36

DEC closer to modular dream

Demo shows touted single product line, 90-sec. upgrade for 6300 family

ANALYSIS

BY JAMES DALY
CW STAFF

At Digital Equipment Corp.'s recent introduction of the mid-range VAX 6300 series, Vice-President of Mid-Range Systems William Demmer motioned to his left as the lights dimmed and a spotlight lit up the new line's predecessor, a single-processor VAX 6210.

As Demmer made his closing remarks, the spotlight again pierced the darkened room. The same machine remained, Demmer announced, but now it was a six-processor VAX 6360.

What happened? In the inter-

vening minutes, he announced, a DEC official had opened the 6210 and replaced its board with six of the updated 6300 boards. The upgrade took less than 90 seconds.

Happy family

In that simple and effective demonstration, DEC came closest to completing a plan it has kicked around for well over a decade: establishing a modular family of computers.

The ultimate purpose of that strategy, as stated by DEC President Ken Olsen, was to enable users to implement systems at each level of their organization — from the desk top to the overall company — that can be tied

together and expanded effortlessly.

Sometimes the goal seemed elusive; other times it appeared downright abandoned. In the development of a VAX line three years ago, DEC offered the Microvax II and VAX 8200, 8300, 8500, 8600, 8700 and 8800 with almost no board-swap upgrade paths.

With the introduction of Vax-clusters, however, the idea seemed to have returned to the mills of Maynard, Mass. Vax-clusters permitted upgrades from stand-alone systems to a shared-resource environment, yet they implemented a site's current CPUs and peripherals in

Continued on page 36

Deloitte in final stage to decentralize

BY ROSEMARY HAMILTON
CW STAFF

Deloitte Haskins & Sells recently shifted into high gear on a consulting project in which the stakes are higher than perhaps ever before. This time the client is itself.

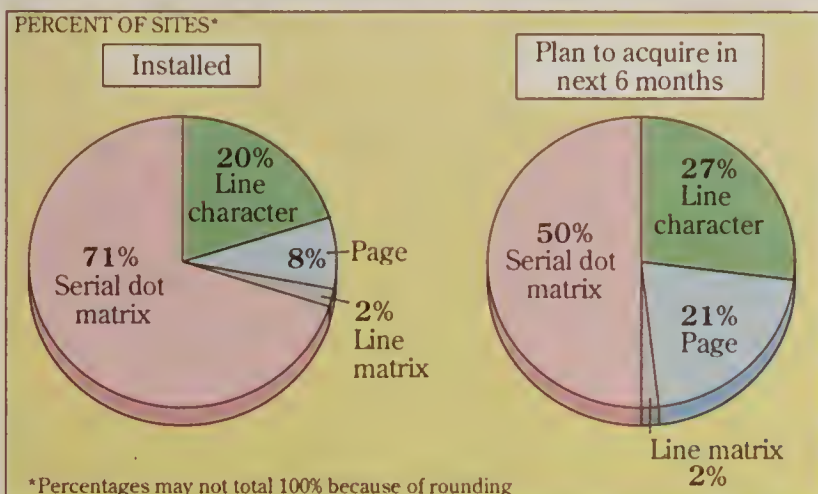
The Big Eight firm is moving from a centralized environment that connected 100 offices nationwide to a Bull H. N. Information Systems, Inc. DPS 90/91 mainframe at the corporate data center in New York. The more costly decentralized system will

Continued on page 32

Data View

Printer plans

September 1988 surveys of some 500 user sites show serial dot matrix printers are still predominant in the IBM 370 environment but that line and page printers are gaining ground



IBM ponders 100-MIPS RT

BY AMY CORTESE
CW STAFF

IBM's Micro Channel Architecture and 100 million instructions per second are in store for future versions of the RT, according to Nick Donofrio, president of IBM's Advanced Workstation Division.

In a recent interview, Donofrio also said AIX, IBM's version of AT&T's Unix System V, which the RT runs, will probably come with a choice of graphical user interface — either Next, Inc.'s Nextstep or the Open

Software Foundation's OSF/Motif. Donofrio said IBM is currently evaluating Nextstep and will look at OSF/Motif when it is available.

Despite its lackluster past, the RT is being groomed for a role of increasing importance at IBM, reflecting the emphasis that the company placed on its AIX operating system one year

Continued on page 35

Inside

- Fingerhut turns to ESA for storage capacity. Page 31.
- And then there were 10,000 AS/400s in Europe. Page 31.
- Reengineering IBM CICS. Page 37.

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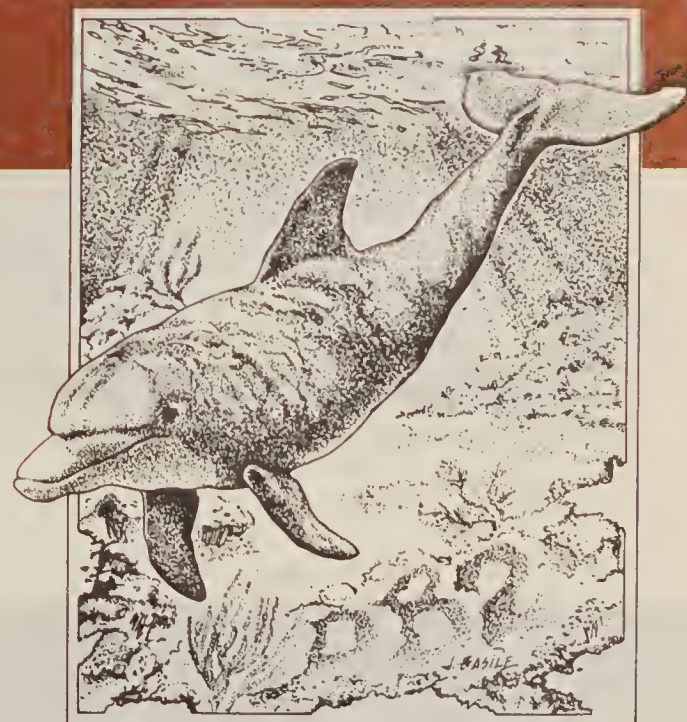
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HARD
TALK

Rosemary Hamilton

Who is IBM
helping?

IBM recently showed just how shrewd it can be with the announcement of its restructured maintenance

service offering.

The company came out with a plan that really does address a long-standing request from users: Make maintenance administration easy. But in helping users out, it will likely go a long way in helping itself.

The maintenance-made-easy concept, according to IBM, means one contract instead of 25. Users contacted last month said this means a big savings in the time spent reading and signing documents.

To help users select the kinds of service options they want, IBM provides a one-page document that lists the options by category. To make it even easier, each category has a cute little icon to identify it. Users no longer have to wrestle with multipage documents for each individual option. How easy it is for the user to select an option — or more than one — from this one page.

Previously, a user might have been discouraged from selecting more options because it meant more paperwork and contracts. But now, it will be as easy as putting one's initials alongside the options listed on the page.

This announcement shows

Continued on page 32

Retailer cashes in on ESA

\$1B Fingerhut looks to speed file access with IBM system

ON SITE

BY STANLEY GIBSON
CW STAFF

ST. CLOUD, Minn. — For mail-order retailer Fingerhut Co., the huge storage capacity of IBM's MVS/ESA operating system will make retrieving thousands of inventory records faster and easier. The \$1 billion firm is counting on the speedier access to help it keep up with an ever-increasing volume of orders.

"We depend tremendously on computing," said Mike Dille, managing director of data processing. Fingerhut runs 105 production applications, including payroll, accounts payable, order fulfillment and shipping on two IBM 3090 Model 400S mainframes. The firm also maintains an extensive mailing list and performs 350 million mailings per year of such items as catalogs

and promotional materials.

Fingerhut began life in the 1950s as a direct-mail firm specializing in automobile seat covers. The company gradually diversified, however, and now has some 50,000 stockkeeping units — specific articles of merchandise. Last year, Fingerhut broke the \$1 billion mark in sales.

In the middle

Because it does not have stores spread across a wide geographical area, Fingerhut has found it natural to keep its data processing centralized. "In large volumes, distributed processors really don't hack it," Dille said.

As it is for all retailers, the holiday shopping season is by far the busiest of the year at Fingerhut. During late November and early December, Fingerhut received as many as 150,000 orders per day and 200,000 to 300,000 payments per day, ac-

cording to Dille.

Just as the high tide of the holiday season was subsiding last year, Fingerhut made its move to IBM's Enterprise Systems Architecture (ESA). The switch went hand in hand with the installation of the 3090 S model processors. Despite minor glitches, Fingerhut has brought ESA up without great turmoil.

Not too hard

"There was nothing terribly complicated about it. It was not a bad conversion," Dille said. At first, ESA was implemented on a 3090 Model 300E and a 3090 Model 600E. Each system was soon replaced with a 3090 Model 400S.

The first S model was moved in during the first week of December; the second was installed about two weeks ago. Dille said it is too soon to tell whether or not the S models have any particular

performance advantage running ESA than their E model predecessors, except for the power boost advertised with all S models.

The obstacles to the ESA conversion had mainly to do with getting utility software to work with ESA. "We had to wait a few months for the vendors to catch up and issue the ESA versions of their packages," Dille said. Even then, there were small difficulties, he added.

They had three problems with non-IBM software — which Dille declined to name — that was used to monitor the I/O subsystems and CPU utilization. He added that even IBM packages were not free from minor bugs.

"But there were no obstacles that made it necessary to back out of the conversion. The guys [Fingerhut systems engineers] found ways around the problems," Dille said.

In all, Dille said the move to ESA took one-third of the time it took Fingerhut to implement MVS/XA.

The expanded memory of
Continued on page 33

AS/400 makes its mark
in European market

BY JANE LAWRENCE
IDG NEWS SERVICE

LONDON — La Compagnie Generale Calberson, based in Le Havre, France, was just another transport company until it discovered IBM's Application System/400. It took delivery of 83 machines in December and was proclaimed the 10,000th AS/400 customer in Europe.

For Calberson, the event was probably no more than a passing note before a return to business. But it was a milestone for IBM.

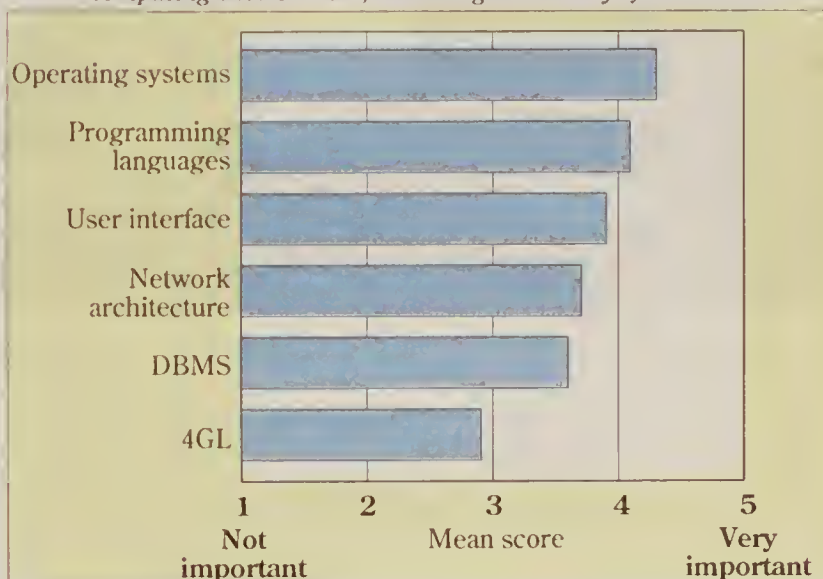
Europe and the rest of the world outside the U.S. are expected to be key markets for the AS/400, IBM's follow-on to its System/34, 36 and 38 minicomputers. According to IBM, as much as 45% of its AS/400 revenue may come from outside the U.S., with up to half of the AS/400 sales at sites new to IBM. But Dataquest Ltd., a London-based market research firm, suggested that new users will account for only about 20%.

Continued on page 33

Data View

Elements of an open system

A standard operating system is the most important part of an open computing environment, according to a survey of 199 users



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IBM helps

FROM PAGE 31

that IBM is running maintenance service as a separate, strategic business unit, observed Donald Blumberg, a consultant in the maintenance industry.

What it also shows is IBM's keen understanding of the customer base. As IS departments become more sophisticated and responsible for strategic goals of their company, they have less time to spend on the mundane business of maintenance. But maintenance remains a priority because the systems have grown more complex to match their department's new sophistication. The ideal solution is to find someone who has the time and

the know-how to handle maintenance issues. Enter IBM.

As Blumberg noted, IBM's goal is to become a customer's single provider of a complete service package. Take Kendall Co. in Boston. Ron Cipolla, the company's MIS director, has been overseeing a massive project that will standardize nearly all Kendall units on IBM Application System/400s. A project like this leaves little time for other issues. So IBM, Kendall's maintenance provider, is also working with the company on other matters. For instance, Kendall signed on to the service option that calls for IBM to design Kendall's computer room.

According to Blumberg, IBM's strategy is going to work and work well. That means third-party maintenance provid-

ers have their work cut out for them. Most third parties have not yet caught up with this kind of customer, he said. Instead, they approach the market by offering cheaper maintenance charges than the standard IBM rate. But customers want more than that these days. Until they respond to the changes in their customer base, they will likely lose business to the shrewdness of IBM.

"Third parties have to get more sophisticated," Blumberg said. "About 90% of them still have a marketing approach that says, 'We sell at prices lower than IBM.' Clearly, it's going to take more now."

Hamilton is *Computerworld's* senior editor, systems.

Deloitte

FROM PAGE 27

be based on a network of 48 Honeywell DPS 6 Plus minicomputers. Bull is the new name of the former Honeywell Bull, Inc. The change will mean fundamental changes in the way Deloitte Haskins does business. The company began the project more than three years ago. Last month, the final phase began as the first few minis were installed. The next nine months should be a frenzy of activity, said Alec McLaren, a Deloitte Haskins partner responsible for the project. The firm hopes to be fully decentralized by September.

According to McLaren, the primary benefit will be an up-to-date system that finally gives the firm's consultants timely and accurate data to work with in the field. He estimates the total cost of the project to be more than \$20 million; about half was spent on new hardware, software and networks, and the balance is being put toward planning and training.

Business change

A multiyear project was required because it involved not just a change in computer systems but a change in the firm's business practices, McLaren said.

Currently, all transactions such as signing on a client or billing are mailed from local offices to the corporate data center in New York. Clerks in New York input the data from the 100 local offices. When this project is complete, however, all transactions will be performed either at the local office or transmitted there from a portable personal computer by a Deloitte Haskins staffer on the road. The local office will transmit its daily and weekly information to the corporate mainframe. The mainframe will remain part of the new setup, but instead of doing the daily work, it will compile the subtotals of the other systems.

When figuring out how to get to that point, Deloitte Haskins assembled a project group, numbering 80 people. This group was split into teams, each of which was responsible for a different aspect of the project. Small teams were formed for each major application area.

And now . . .

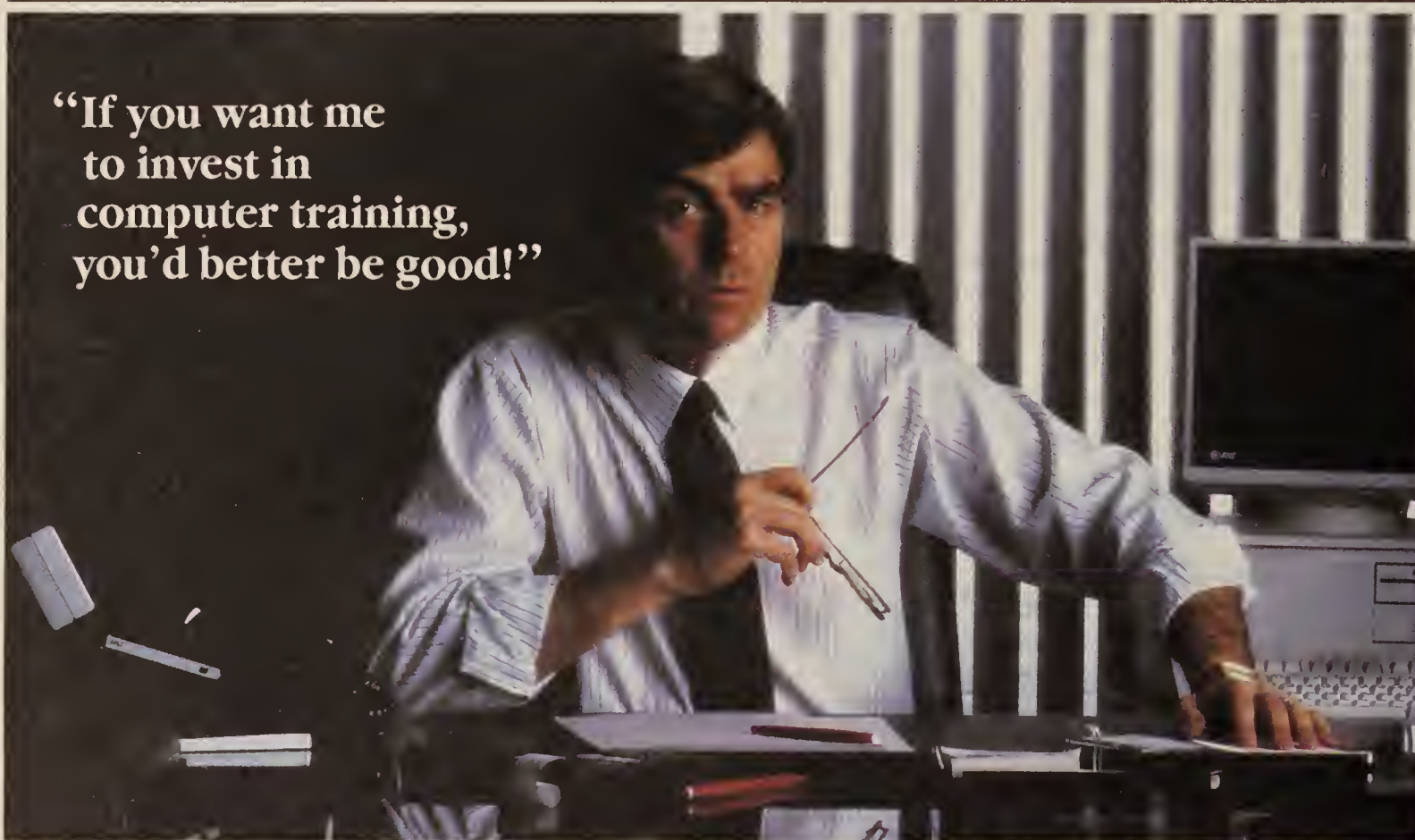
Once the application requirements were pinpointed, MIS stepped in. McLaren said the applications now rolling out are a mix of programs developed in-house and modified off-the-shelf software.

The hardware selection was simple. Deloitte Haskins has a long-standing relationship with the former Honeywell Bull. The company has been selling Deloitte Haskins computers since the 1960s, and it is a Deloitte Haskins client.

When all the hardware and software pieces were identified, Deloitte Haskins faced its biggest hurdle: the users.

The firm will need to train as many as 3,000 people on the new system. While the training takes place, so does the campaign to win over users. McLaren said this has gone surprisingly well. The project team had management support "up and down the line," he said, and when the team tests out a new application, it requests comments from users and adjusts the system based on those requests.

"That has brought us a lot of good will," McLaren said. "They now understand that [the systems] will be a little rugged the first time out but that they will be improved."



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Retailer

FROM PAGE 31

ESA will allow Fingerhut's applications to bring files into memory easier than can be done now, Dille said. Under MVS/XA, Fingerhut had already built a table to allow entire files to reside in memory and allow faster access to the data in the files than would be possible should the files reside on disk.

No intervention required

ESA will allow a similar capability but will not require programmer intervention. "We won't have to create a table; we can

just tell the operating system to do it," Dille said.

With ESA, applications will run as though disk access is being performed, so the program will not know the difference, Dille explained.

Using System Managed Storage (SMS) as an adjunct to this will be even better. SMS will automatically help allocate data sets, a time-consuming task that

Fingerhut is now performing manually.

Dille is also eager for the ultimate promise of SMS: to recognize how data is being used and automatically migrate it across I/O subsystems — although he likened the advance to Star Wars.

"If it'll do what it's supposed to do, it'll be great," he said.

Although Dille said he looked

closely at PR/SM, the feature that partitions a CPU into as many as six logical units, he has no plans to implement it, preferring to use a single-system-image approach.

Dille's operations center is in St. Cloud, Minn., 75 miles from Fingerhut's headquarters in Minnetonka, a suburb of Minneapolis. Fingerhut is owned by Primerica Corp., which was re-

cently acquired by Commercial Credit Corp.

Dille says he is aware that anytime a company changes hands, there is always the chance that changes could be made to computer operations. However, he said, early signs are clear that there will be no changes to Fingerhut's operations by merging data centers or other measures.

European

FROM PAGE 31

IBM is dependent on its existing System/34, 36 and 38 users upgrading to the new mid-range if the AS/400 is to be a big success.

System/38 customers reportedly have the easiest path to the AS/400. According to IBM, they simply transfer their software to the new machine. But they are a minority of the firm's mini user base — only 40,000 out of a total 300,000 installations. System/36 users interviewed said they have a trickier conversion and must recompile their software to run on the AS/400.

Construction firm Balfour Beatty's international division, headquartered in Croydon, England, is transferring its software from two System/36s to an AS/400 Model B30.

George Tutt, the firm's senior systems engineer, said he is fairly impressed with the AS/400, but the machine has not been without problems. The date function failed, and engineers have replaced items such as the controller and linkage card. But Tutt is philosophical: "They're just teething problems."

Choosing which AS/400 to buy was difficult. Tutt said the B40 was "massive" for Balfour's need, but the B30 was too small. The company finally opted for a B30 with upgrades.

Tutt said it is difficult to judge the performance of the AS/400 so far but thinks the new machine is slightly faster.

Other System/36 users have, however, complained of performance degradation after conversion. Mike Moore at London-based bullion dealer Mocatta and Goldsmid is considering upgrading his System/36. But, he explained, "Conversion for 36 users is not at all good news. I have spoken to a number of people and they have had difficulty in getting going." He called for development of tools such as the existing IBM System/36 Migration Aid, which helps users analyze data, libraries, files and programs prior to migration.

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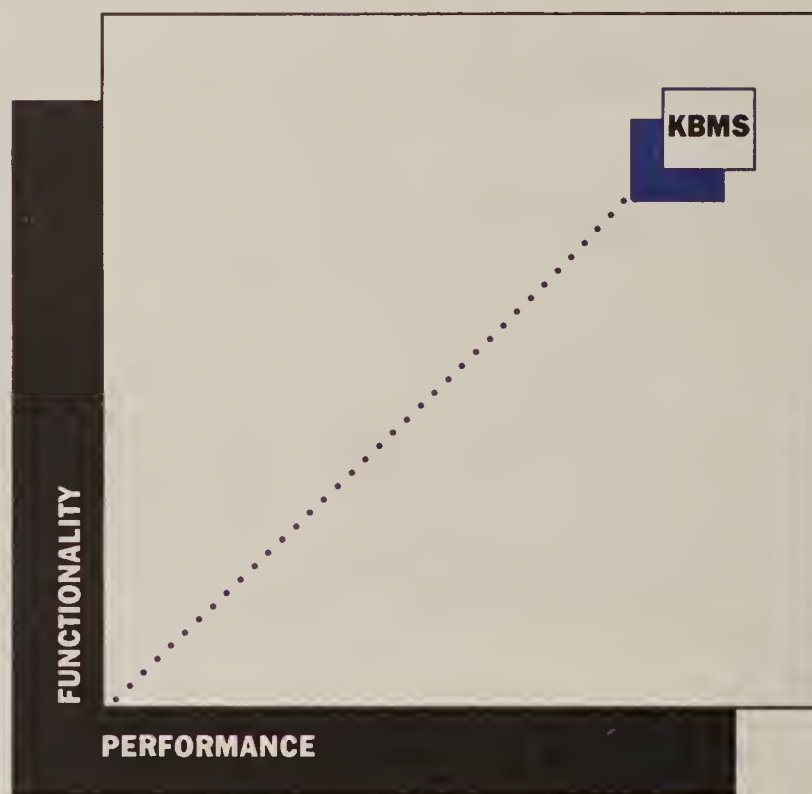
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IBM ponders

FROM PAGE 27

ago. Donofrio's Advanced Workstation Division, spun off from and now at a peer level with IBM's Entry Systems Division, is charged with the future of both the RT and AIX. In addition to polishing the RT's image, the group will also implement AIX on new platforms.

The 1,800-employee division began its life in December amid the shake-up caused by the departure of IBM Entry Systems Division President William Lowe. Donofrio was formerly vice-president of that division.

The RT follow-on, which has been discussed by IBM officials before and is anticipated to be released in the 1991 to 1992 time frame, is expected by many to be based on a new chip design and 64-bit architecture that will boost it over the 100 MIPS threshold, or 10 times the RT's current capability.

Clare Fleig, director of re-



IBM's Donofrio

search at International Technology Group in Los Altos, Calif., predicted that the machine will be a hybrid, including a reduced instruction set computing processor and a conventional Intel Corp. 80386-based processor.

Closer at hand, the RT will receive boosts in the coming year in hardware and software performance, and AIX will make its debut on IBM's Personal System/2 and 370 families, according to Donofrio.

However, analysts agree that IBM will have to overcome many obstacles to succeed in this highly competitive and rapidly changing market.

From its introduction in 1986, the RT has been plagued with charges of poor performance. Although performance has improved, the reputation still clings, and analysts say it will be hard to shake. In comparison, Sun Microsystems, Inc. has been steamrolling along, and Digital Equipment Corp. has generated a lot of interest with product introductions.

Donofrio acknowledged that the going will be tough, saying that IBM has improved the per-

formance of the RT but still has a long way to go. "We're not suffering from delusions of grandeur," he admitted.

Dave Wilson, president of Workstation Laboratories, a benchmarking lab in Dallas, said that although the RT was underpowered when it came out in 1986, it is competitive today with workstations in the \$20,000 to \$30,000 price range.

THE RT is being groomed for a role of increasing importance at IBM, reflecting the emphasis placed on AIX.

IBM will focus on the family concept for its AIX line, providing AIX on the RT and PS/2, all the way up to the mainframe. This strategy will prove success-

ful for IBM when selling to corporate accounts that want to tie their workstations into the mainframe, Fleig predicted.

A key IBM advantage will be

data management capabilities it has engineered in AIX, such as those provided by the virtual resource manager, she said. However, OSF/1, which will be based on AIX, could also offer this advantage, depending on how OSF chooses to implement AIX. AT&T could reengineer its Unix System V to improve data management in the future, she added.

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Gibson

CONTINUED FROM PAGE 27

Cincom, however, made lavish professions of supporting Supra Version 1 users "forever" and promised new releases with important enhancements as well. Such pronouncements give solace to users and are absolutely required to avoid alienating them. But with a user base at risk, why would Cincom take the chance of changing course at all?

The answer can be given in three letters — IBM, or specifically, IBM's DB2, which has made Cincom's life miserable in large mainframe accounts, the prime turf of Supra Version 1. "It will be easier to compete against Oracle than it was to

compete against IBM," said Tom McLean, vice-president of marketing and product planning at Cincom.

So, although Cincom will support its current stable of users, it will not seek new sales in those users' market as aggressively as before. It will refocus itself on somewhat smaller shops, often with DEC or Unix-based systems.

Heat of the competition

The Cincom change of field parallels the moves of others that have felt the intense heat of competing with DB2. Cullinet is similarly implementing SQL and is targeting the DEC and Unix markets.

What happens if Cincom succeeds with its new strategy? Supra Version 1 users would be pleased that their vendor

would survive, financially sound and able to offer them continued support. On the other hand, those users would become outnumbered as the Cincom user base evolved into two camps: SQL-based distributed and smaller accounts and non-SQL IBM mainframe shops.

Version 2 customers are the users of tomorrow and probably will be getting the lion's share of enhancements. They probably will become dominant in the Cincom community.

Is this a choice Cincom liked to make? Probably not, although there is precedent for it. The company once offered a teleprocessing monitor only to see IBM's CICS gain dominance.

Observing Cincom picking its way through an obstacle-strewn field in this

way gives one sobering thoughts on the sheer marketing muscle of IBM.

What we have here is another example of IBM choosing a market and going after it. After a struggle, the vendors that created that market essentially hand it over to the industry giant.

Gibson is *Computerworld's* senior editor, software.

DEC

CONTINUED FROM PAGE 36

the process. Similarly, 1986's introduction of Local-Area Vaxclusters, which allowed Microvaxes to become members of a Vaxcluster over an Ethernet, went a step further.

When DEC introduced the Microvax 3300 and 3400 in October, it also introduced a disk subsystem based on a high-end subsystem design but intended for low-end machines. The move was supposed to be a first step in streamlining disk subsystems so that customers could work with one interrelated disk subsystem family.

With its recent announcement, DEC has taken one more step toward making good on its earlier vows. Essential to this is the way the firm allows 6200 users to upgrade to the Young Turk of its microprocessor family: a souped-up chip capable of processing 3.8 million instructions per second (MIPS). The 6300 shares the same I/O structure, interconnects, software and powerful 80M byte/sec. XMI internal bus that made the 6200 successful. All DEC did was speed up the chip.

"This is the key," said John Logan, executive vice-president at the Aberdeen Group, a market research firm based in Boston. "As a result, the system can be upgraded with faster processors or higher density, faster-access disks because the bus can take it."

Role model

The new system, then, is essentially a frame on which to build. "The rest of the system was overdesigned to start with, and in that way, a user makes one investment in the platform and reaps the benefits over several generation of products," said Stephen Blanchette, DEC's product marketing manager for mid-range systems. Additionally, rumors have been bandied about that the company plans to roll out a Microvax line based on the new chip later this year. This, too, is good news for users.

There are many reasons DEC took so long to reach a position it voiced so long ago, Logan noted. A key stumbling block is that DEC, like many large computer firms, uses several squads of research teams working on a similar product. The teams try to beat each other on a number of problems and the group that solves its problem first has the technology that will be emphasized.

But if, as Demmer suggested at the rollout, DEC has truly inaugurated a price/performance booster cycle it expects to repeat as often as every nine months, a modular growth foundation is bedrock to its success.

Although the new chip will also be replaced (a follow-on able to process 7 MIPS is reportedly in the final design stages), the new microprocessor establishes a good and — DEC hopes — long-lasting trend of simple upgrades.

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NEW PRODUCTS — SOFTWARE

System software

Language Technology, Inc. has announced an automated re-engineering tool for IBM CICS on-line applications.

Called the **CICS/Recoder**, the product allows applications programmers to decipher and untangle CICS/Cobol code, according to the vendor. The software provides a four-part set of HANDLE reports, designed to complete the documentation package necessary for tracing and supporting CICS applications.

CICS/Recoder is available by license agreement with prices ranging from \$87,000 to \$174,000 depending on the number of Cobol programmers per site.

Language Technology, 27 Congress St., Salem, Mass. 01970. 508-741-1507.

D & E Software, Inc. has released **VSAM Control Online (VCON)**, a software designed to tune and inspect CICS VSAM files and LSR Pools in an on-line environment.

The product reportedly provides IBM MVS users with status and analysis information, problem determination, LSR Pool performance information and on-line file control and entry display functions.

VCON is available for a one-time fee of \$6,995.

D & E Software, 8020 Old Alexander Ferry Road, Clinton, Md. 20735. 301-868-6866.

Database management systems

Global Software, Inc. in Duxbury, Mass. has released version 5.0 of its mainframe software utility for users of large corporate databases with data dictionaries.

\$Name 5.0 is said to work in conjunction with the company's Hugo/Silas/ISPF front end and handles multiple languages and redundancy searches. As a set of callable subroutines, the product costs \$11,000. It is included in the \$25,000 price of Hugo-Silas/ISPF, which is an IBM DB2 interface to Datamanager.

Global Software, P.O. 2087, Duxbury, Mass. 02331. 617-934-0949.

Telemap Corp. has introduced a software package that automatically generates, executes and saves Cobol programs for IDMS databases.

According to the vendor, its **Teleview** package allows the user to generate any selected report, in any format, from an IDMS database simply by defining fill-in-the-blank variables on

a series of screens.

Teleview costs \$16,500, which includes the first year of maintenance and support. The annual maintenance fee is 15% of the current license fee.

Telemap, Suite 407, 4401 Rockside Road, Independence, Ohio 44131. 216-447-9300.

Development tools

A program design language developed to satisfy Department of Defense mandates has been introduced by **Software Systems Design, Inc.**

The computer-aided software engineering tool, called **Adadl**, reportedly combines Ada with project management tools to provide portability among medi-

um-, large- and very large-scale computer programs. According to the vendor, the product is a superset and extension of Ada and includes a definition dictionary.

Adadl is priced from \$7,150 for smaller host computers — such as those of Sun Microsystems, Inc. and Apollo Computer, Inc. — to \$15,700 for larger systems. Delivery is quoted off-

the-shelf.

Software Systems Design, 3627 Padua Ave., Claremont, Calif. 91711. 714-625-6147.

Boston Systems Office, Inc. has announced a language-sensitive editor for the Digital Equipment Corp. VAX/VMS computing environment.

Called **BSO/LSE Plus**, the

Continued on page 38

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Continued from page 37

product will reportedly provide embedded system programmers with multiwindow and multilanguage capabilities. The software facilitates editing, compiling, assembling and reviewing within a single editing session and is priced from \$500, the vendor said.

BSO, 128 Technology Center, Waltham, Mass. 02254. 800-458-8276.

The **Thoroughbred Division** of Concept Omega Corp. has announced that its fourth-generation language development package, **Idol-IV**, is now available to run on Digital Equipment Corp. VAXs.

The product consists of three components: Dictionary-IV, Report-IV and the Script-IV 4GL development language.

Pricing for systems running VMS 4.4 or higher ranges from \$2,295 for eight users to \$13,495 for 128 users.

Thoroughbred, P.O. Box 6712, 19 Schoolhouse Road, Somerset, N.J. 08875. 800-524-0430.

Languages

Oasys, Inc. has announced the availability of its proprietary implementation of AT&T's object-oriented C Plus Plus language on Digital Equipment Corp.'s recently announced Decstation 3100 systems.

Called **Designer C Plus Plus**, the product runs on DEC's entire line of VAX and Vaxstation systems under both VMS and Ultrix, the vendor said. It is said to en-

hance the C language by providing extensive data abstraction, option-strong type-checking, operator and function overloading and other object-oriented programming facilities.

Designer C Plus Plus for the Decstation 3100 costs \$5,000. Maintenance is priced at \$900 per year.

Oasys, 230 Second Ave., Waltham, Mass. 02154. 617-890-7889.

A fourth-generation language productivity tool for IBM Application System/400 computers has been announced by **Michaels, Ross & Cole Ltd.**

The **MRC-Productivity Series** reportedly allows programmers to modify applications and convert them to native mode when migrated from other systems

to the AS/400. The software generates an externalized database and will automatically document the conversion process.

The **MRC-Productivity Series** is priced from \$5,000 for the AS/400 Model B10 to \$35,000 for the Model B60.

Michaels, Ross & Cole, Suite 203, 450 E. 22nd St., Lombard, Ill. 60148. 312-916-0662.

Concurrent Computer Corp. has announced that a new version of the company's ANSI/Mil Spec 1815A Ada Programming Language will be available in the first quarter.

Operating on the Concurrent Model 3280MPS computer under OS/32, the **C3Ada** language system will reportedly offer an enhanced compile time of 600 to 1,000 line/min. as well as four compiler directives for improving runtime efficiency.

The C3Ada compiler costs \$24,900.

Concurrent, 106 Apple St., Tinton Falls, N.J. 07724. 201-758-7000.

Applications packages

Global Software, Inc. has announced its **Financial Institution Materials Management System (FIMMS)** for IBM minicomputers and mainframes.

The on-line system was designed specifically for multilocation, multifacility organizations such as banks, savings and loan associations and insurance companies, the vendor said. Features include real-time requisition processing, tracking and consolidating as well as on-line query capabilities.

FIMMS is priced from \$125,000 to \$300,000, depending on hardware configuration.

Global Software, 1009 Spring Forest Road, Raleigh, N.C. 27615. 800-366-7890.

IMSL, Inc. has announced a series of software libraries for Hewlett-Packard Co.'s 9000 Series 800 systems.

The **IMSL Libraries** reportedly run under the HP-UX operating system running on the HP 9000/Fortran compiler. The products include **Math/Library** for solving mathematical problems, **Stat/Library** for statistical data analysis and **SFun/Library** for analyzing special functions.

The annual fee for the complete IMSL Libraries group on the HP 9000 ranges from \$1,800 to \$3,500 for the first year of implementation.

IMSL, 2500 Parkwest Tower One, 2500 Citywest Blvd., Houston, Texas 77042. 713-782-6060.

Carolian Systems International, Inc. has released **Version A.04.00** of **Sysplan**, the company's performance analysis and resource planning tool for Hewlett-Packard Co.'s 3000 series computers.

An expected highlight of the latest release is the ability to modify the value of any point or points that are on a line graph. There is also a "scattergram" function that reports the usage of two resources on a single machine, according to the vendor.

Sysplan A.04.00 is priced from \$4,000, depending on the size of the processor.

Carolian Systems, 3397 American Drive, No. 5, Mississauga, Ont., Canada L4V 1T8. 800-263-8787.

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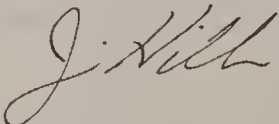
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Computer Consoles, Inc. (CCI) has upgraded its Unix-based office automation software.

Officepower Version 4.02 reportedly offers several integration tools and user features not previously available, including bidirectional document conversion capabilities, a tool for customizing interfaces to graphics printers and a set of utilities and libraries for C language programmers.

Officepower 4.02 is priced from \$1,995 to \$39,995, depending on CCI platform and number of users.

CCI, Computer Products Division, 9801 Muirlands Blvd., Irvine, Calif. 92718. 714-472-7605.

A computer-aided design software package that runs on Sun Microsystems, Inc. and Apollo Computer, Inc. workstations as well as on Hewlett-Packard Co.'s 9000 Series 300 has been announced by **Eesof, Inc.**

Academy provides a graphical design environment focused on the needs of the microwave and radio frequency engineer, the company said. The program utilizes layout-driven simulation and produces both production and report documentation.

Pricing ranges from \$6,000 to \$14,000, depending on platform, configuration and options.

Eesof, 5795 Lindero Canyon Road, Westlake Village, Calif. 91362. 818-991-7530.



Eesof's Academy

Hewlett-Packard Co. has released a version of the HP Manufacturing Management II (MM II) software for manufacturing resource planning (MRP) applications.

The **HP Materials Management/Advanced Version** module includes back-flush for recording the consumption of raw materials and the manufacture of products, alternate parts to indicate the use of alternate recipes or components, by-products for planning production and recording use and selective MRP for anticipating the impact of changes to orders. HP MM II, which includes the HP MM/AV module, ranges from \$170,000 to \$300,000, depending on configuration.

HP, Inquiries, 19310 Pruneridge Ave., Cupertino, Calif. 95014. 800-752-0900.

Utilities

H & W Computer Systems, Inc. has announced **SYSD/CPMS Release 6.1**.

The product is said to be an IBM CICS-based productivity tool that features ISPF/PDP-like Edit and Browse, SDSF-like Report Viewing and Routing, CICS/JES2 printer management

and CICS debug and management utilities. The latest version includes automatic requeuing of printed reports and 255-char. print-line capability, the company said.

SYSD/CPMS runs under IBM MVS and MVS/XA with CICS and is priced at \$27,000.

H & W Computer, P.O. Box 15190, Boise, Idaho 83715. 208-385-0336.

Unisys Corp. has announced the **Easy Access Data Interchange (EADI)** system, a Unix-based transaction-handling software package designed to implement electronic data interchange (EDI) communications.

According to the vendor, the product provides automatic tailoring of business documents, purchase orders and sales and accounting documents and gives

users the ability to meet the format requirements of the EDI network and their trading partners.

The software system operates on the Unisys U 6000 series minicomputer and is priced at \$3,500. First shipments were scheduled for delivery last month.

Unisys, P.O. Box 500, Blue Bell, Pa. 19424. 215-542-2243.



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CA-UNIPACK/SRM optimizes storage utilization, often eliminating the need for costly additional hardware. It ensures data integrity by enforcing

installation-defined storage standards and protecting data resources. It increases data center productivity by eliminating labor-intensive, error-prone tasks, freeing up valuable staff, as well as by reducing job elapsed times through faster and more efficient sorting.

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NEW PRODUCTS — SYSTEMS

Processors

A single-slot Motorola, Inc. VMEbus image processor has been announced by **Datacube, Inc.**

According to the company, the **ICS-220** board provides real-time convolution, full analog and digital I/O and histogramming functions. The convolver supports several real-time data format conversion techniques, and the histogramming facility reportedly computes a 256-bin pixel count summary for every frame of data in real time.

The board is priced at \$9,500. A Unix driver for the Sun Microsystems, Inc. Sun-3 workstation is also available.

Datacube, 4 Dearborn Road, Peabody, Mass. 01960. 617-535-6644.

Data storage

Acer Counterpoint, Inc. has announced an **expansion chassis** for its System 15 multiuser computer.

The Intel Corp. 80386-based machine reportedly runs at 20 MHz and offers connectivity for up to 34 ports. It was designed to provide up to 700M bytes of additional storage per chassis. Disk modules are available in 90M-, 150M- and 300M-byte configurations. The chassis and the machine can be used with the company's C-XIX AT&T Unix System V operating system.

The System 15 expansion chassis is priced from \$800 to \$8,600.

Acer, 2127 Ringwood Ave., San Jose, Calif. 95131. 408-434-0190.

Encore Computer Corp. has announced a line of mass storage enhancements for its Multimax 320 parallel computing system.

The I/O products will be incorporated into product shipments immediately, the vendor said. Modifications are said to include a 1.05G-byte formatted 8-in. disk drive; integral-buffered small computer systems interface tape controllers; and an optional mass storage interface card. The Multimax cabinetry has been redesigned to accommodate up to 64 disks and 16 nine-track tape drives, the company said.

The list price of the Multimax 320 with peripherals cabinet is \$148,500.

Encore, 257 Cedar Hill St., Marlboro, Mass. 01752. 508-460-0500.

Storage Technology Corp. has announced support for connection of up to eight host channels on its 4480 cartridge subsystem.

The 18-track tape and car-

tridge unit is scheduled to be shipped in the third quarter of this year and will carry a list price of \$5,040 for each channel interface, according to the vendor.

Storage Technology, 2270 S. 88th St., Louisville, Colo. 80028. 303-673-4400.

I/O devices

CSS Laboratories, Inc. has announced a laser printer specifically designed for departmental needs.

According to the vendor, the **Indy 223** is packaged with a proprietary raster image processor and a Minolta Corp. 22 page/min. print engine. Among other options included are a

2,000-sheet input tray and face-down stacker.

The Indy 223 costs \$19,500.

CSS, 1641 McGaw Ave., Irvine, Calif. 92714. 714-852-8161.

A self-service financial terminal for the banking industry has been unveiled by **NCR Corp.**

The **NCR 5682 Automated Platform Machine** will al-

low bank customers to obtain information, receive a statement and order checks. The color-graphics terminal is also capable of performing customer car-loan approval transactions.

Scheduled for delivery this year, the terminal is priced from \$17,000 to \$20,000.

NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479. 513-445-5000.

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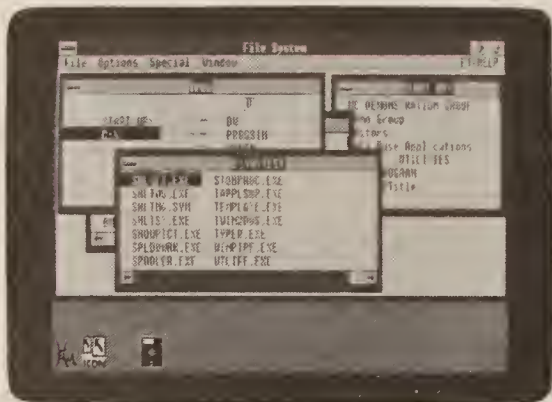
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IBM announces Developer Assistance Program for OS/2 developers.

Software developers who are working on commercial OS/2 products in the U.S. are eligible for the IBM *Developer Assistance Program*. They can join developers at over

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M I C R O B I T S

Michael Alexander

Promote or perish



End users and information center managers are uneasy allies at best, probably because quite a few managers

of this type believe that the rising influence of end-user computing has come at the expense of the information center.

To a large extent, that's true. In companies in which end-user computing is well entrenched, employees buy personal computers without guidance from MIS, set standards, train and support each other and write applications.

But does the growth of end-user computing signal the decline of the information center? Not necessarily, although information center managers will need to find new ways to get along with end users.

End users will not go to an information center if they think the people there cannot deliver the goods. If the center grudgingly doles out support services, end users may feel they are not getting adequate assistance. Without repeat business, no one is in business for long.

The best product in the world is worthless if you can't get anybody to buy it. Promote

Continued on page 47

End users in charge

Lightening the information center's burden

BY MICHAEL ALEXANDER
CW STAFF

When information center managers at UNUM Life Insurance Co. in Portland, Maine, were looking for ways to save money, they asked their end users to help themselves.

"We had too many resources tied up supporting end users," said Don Caton, UNUM's manager of personal computer technology.

By relying on end-user groups to take on more of the training and support duties, the company was able to consolidate five decentralized information centers into one "PC Technology Area" and simultaneously reduce information center support personnel from 60 to six employees.

"We took a 'before' picture for a cost study, but the program is not completed, so we don't have the 'after' picture yet. But I would guess that the savings have been one half or better," Caton said.

The prospect of realizing dramatic cost savings from downsizing the information center is certainly incentive enough for a corporation to establish at least one end-user group. However, there are several other benefits that can be realized by information center management.

Two end-user groups at UNUM, for example, also help the information center with the often tricky job of implementing new technology and provide feedback to information center management about each depart-

Continued on page 46

Glut means 286 bargains

BY JULIE PITTA
CW STAFF

Corporate buyers are getting better deals on Intel Corp. 80286-based systems as these personal computers glut the market.

"Suppliers are much more willing to deal," said Phil Gordon, manager of office systems at Charles Schwab & Co. in San Francisco. "We're not having to do too much to force prices down. The competition between retailers and hardware vendors for business is doing it for us."

Like many MIS departments, Charles Schwab is standardizing on 286s. "It's about all we're buying," Gordon says. In recent months, discounts on 286s have

Continued on page 49

Inside

- IBM group formed as PC software booster. Page 45.
- Apple's Hypercard put to the test. Page 45.
- Vendex gives users head start with its IBM PC-compatible system. Page 53.

MCA vs. EISA: Shedding light on heated debate

ANALYSIS

BY WILLIAM BRANDEL
and DOUGLAS BARNEY
CW STAFF

It is rare that arguments over subtle distinctions become virulent, but that is exactly what has happened with the debate between IBM and its personal computer competitors.

The battleground is the confusing world of advanced PC buses. The issues being debated delve into the intricacies of bus mastering as well as edge-triggered vs. level-sensitive interrupts. Dig deeper, and it gets even more esoteric.

The well-documented combatants are IBM and the Extended Industry Standard Architec-

ture (EISA) group, led by Compaq Computer Corp. along with eight top PC cloners. Fanning the flames, each group has attacked the so-called technical shortcomings and market bungling of the other.

Reduced to its essentials, the EISA group's claim is that IBM has tried to shove an incompatible and useless bus down the throats of unwilling customers everywhere. According to IBM, the EISA bus mimics Micro Channel Architecture (MCA), validates the IBM position, but in the end fails to match the technical prowess of the IBM version.

With the exception of backwards compatibility to the IBM Personal Computer AT, the EISA proposal looks remarkably

Continued on page 49

Head-to-head

IBM and its competitors agree on most technical aspects of the bus architecture but differ on the merits of AT bus compatibility

	Micro Channel Architecture	Extended Industry Standard Architecture
32-bit address	Yes	Yes
Supports burst-mode direct memory access	Yes	Yes
Supports multiple processors	Yes	Yes
Multidevice arbitration	Yes	Yes
Eliminates need for DIP switches	Yes	Yes
Supports AT bus boards	No	Yes
Availability	April 1987	Late 1989

CW CHART: JOHN YORK

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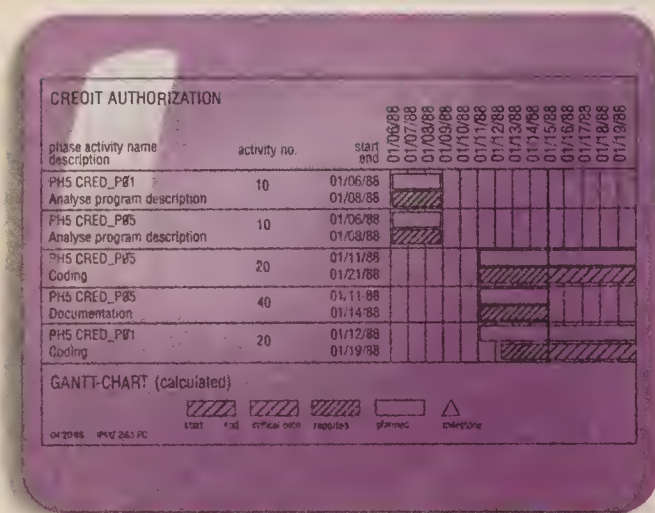
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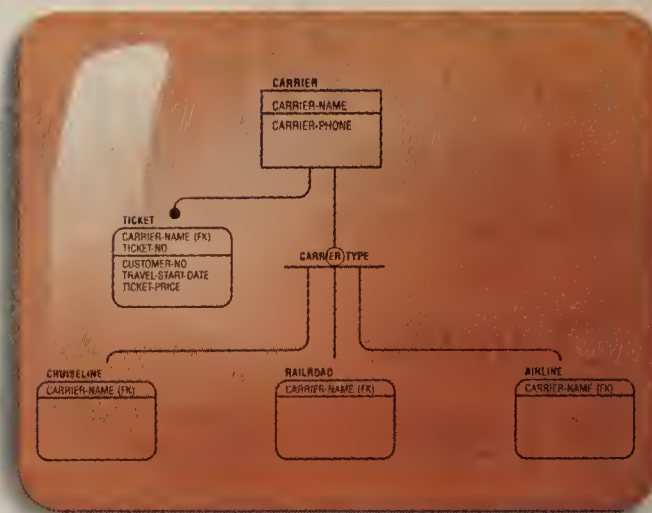
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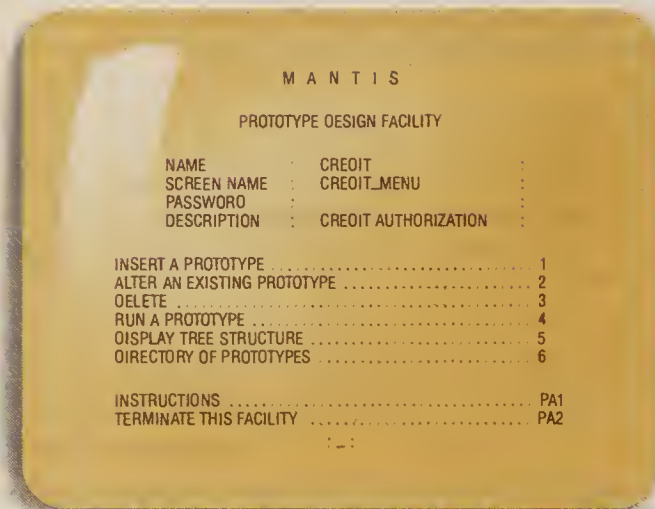
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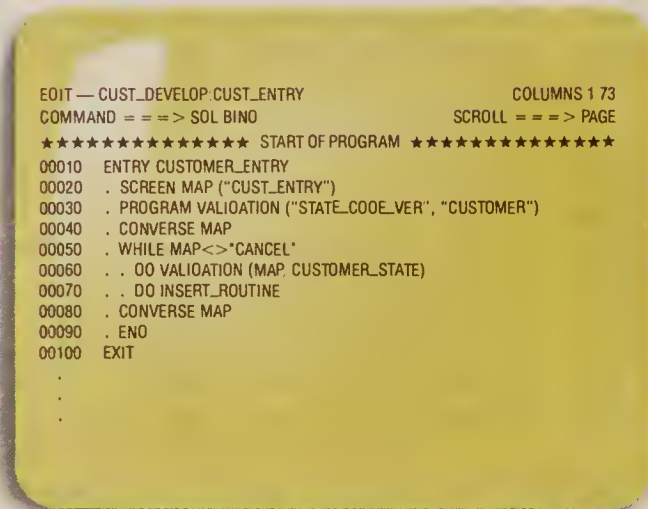
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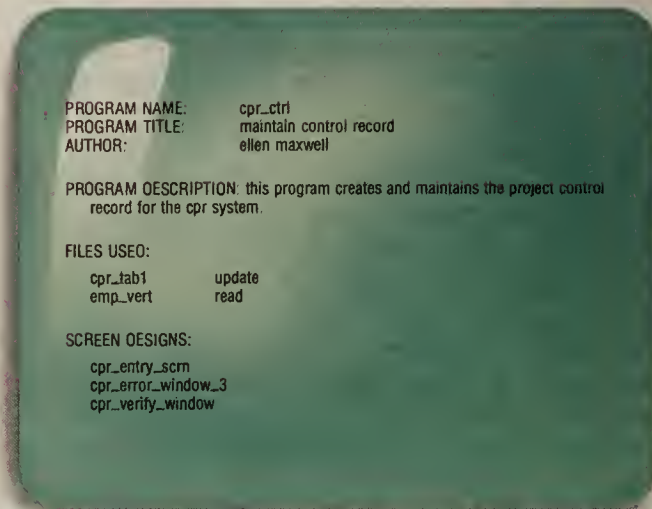
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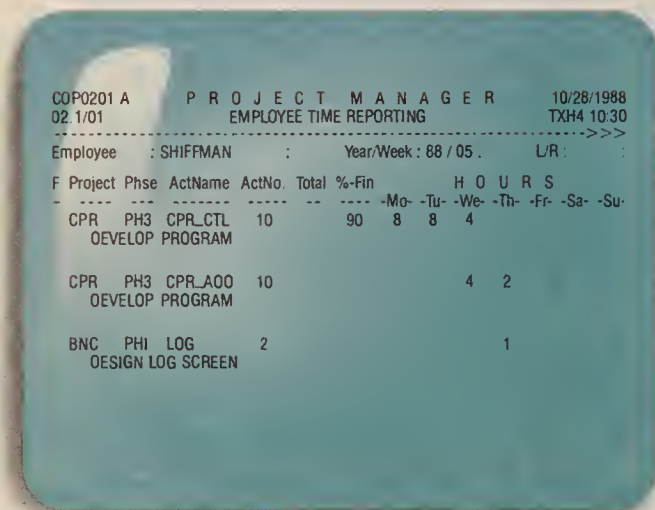
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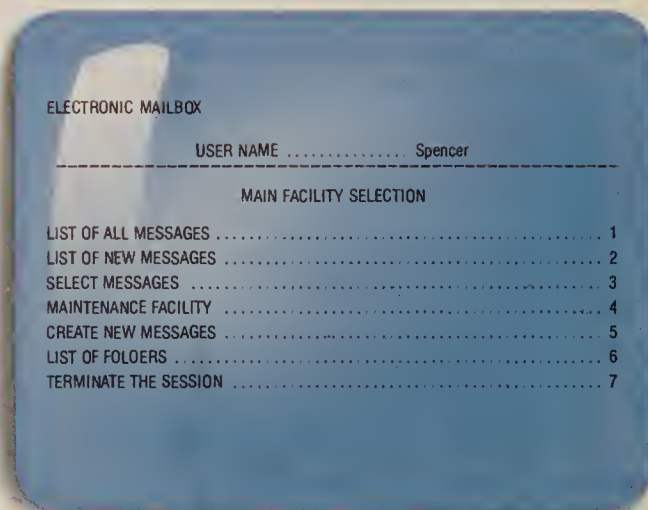
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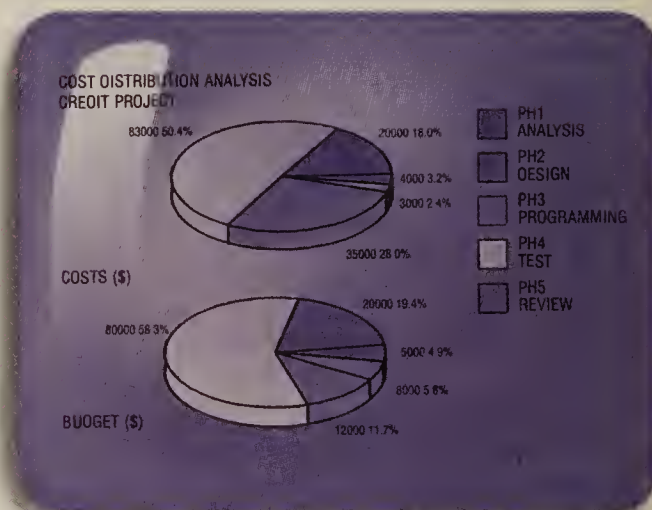
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Transportation
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Adm. Services
23. Dir. Mgr. Suprv. Analyst of Systems
31. Dir. Mgr. Suprv. of Programming
32. Programmer/Methods Analyst
35. Dir. Mgr. Suprv. QA/WP
38. Data Comm. Network Systems Mgt.
OTHER COMPANY MANAGEMENT
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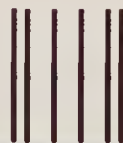
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S M A L L
T A L K

Douglas Barney

Sales: Practice
your pitches

Not all computer salesmen are lunkheads. Of course, not all politicians are crooks, either.

But talk to enough computer customers and you'll hear the horror stories: "They sold me the wrong machine, recommended the wrong software, didn't tell me I'd need a special space on the store's repair bench to fix the same nagging problem and didn't let on that the store was a day away from Chapter 11."

Again, many stores are staffed by decent, God-fearing people who give good advice and excellent service. These folks are no fun to write about, so henceforth, this column will ignore them. Instead, we will focus on the rats.

For instance, the people who sold a new computer with a laser printer to a public relations department of a popular Massachusetts hospital were obviously boobs. These folks neglected to mention that an additional drive was needed to load the fonts. Then, during a service call, they condescendingly referred to a couple of mature women as "girls." It was these "girls" that pinpointed the problem in the first place. The result was an extra \$300 to get the system working right.

And there are the yahoos who tried again and again to fix my friend's Tandy 3000. Each time, the system came back worse. Go back to used cars, guys.

This is not news to MIS.

Continued on page 49

IBM division exposes software

Sarrat details visibility-boosting intentions of Desktop Software Group

IN PERSON

IBM has never been a name-brand vendor of personal computer software. In fact, the \$54 billion computer firm has been overshadowed not only by PC biggies such as Lotus Development Corp. and Microsoft Corp. but by bold upstarts such as Borland International.

This image is not likely to change with the recent creation of the Desktop Software Group. Instead, IBM will work to boost the visibility of packages from small, underfinanced organizations. The company will also develop relationships with medium-size companies that seek marketing and technical assistance.

At the same time, IBM appears to be deemphasizing its own applications software efforts in favor of marketing deals with smaller, and perhaps more creative, companies.

Computerworld Senior Editor Douglas Barney recently spoke with Fernand Sarrat, general manager of IBM's Desktop Software Group, to discuss plans for IBM's embryonic software efforts.

Why was the Desktop Software Group formed?

The genesis came when the Application Software Division was presenting its strategy to John Akers and our management committee, and the question came up about revenue from PC software.

John asked that we look at it, a task force was put together, and the recommendation was this unit. I came on board with no desk, no pencils.

How is this effort different from previous ones?

The arrangements with people like Software Publishing [IBM remarketed this firm's PFS series] were heavily oriented to-

ward launching our PC offerings at the time.

The differences are, first, the focus on software as a business in and of itself. The second is that, from a marketing standpoint, our prior efforts were focused on the development side and not as much on the marketing side. This time, we are going to put in place a dedicated sales force and allocate the dollars to do the marketing launch.

Who will you be pitching the product to?

The sales force's primary objective is to work with the retail channels. When they go into large accounts, it would be to support efforts that retailers have going.

How many products will be from IBM?

I would say, on the front end, products like Displaywrite's revenue stream will be very significant compared with the new entries into the portfolio.

But as time goes by, the mix will change. The objective is to really take products from the outside rather than develop them. Our objective is not to write a set of specs and develop but to act as facilitators for developers to bring products to market.

Will IBM be marketing products that are currently in development?

It can vary across the spectrum. We are working right now with small developers that do not have any marketing capability on products that are not on the market today.

We are also working with small developers that have products on the market, and we are working with medium-size PC software companies that have both products on the market and a marketing capability themselves.



IBM's Sarrat

Are you looking for particular operating system platforms?

Now the focus is on DOS and OS/2, but we are open-minded. At some point, we will take a look at [IBM's] AIX as part of the charter, and we are not closed-minded about taking a look at the Apple environment sometime down the road.

Will IBM help these products become more Systems Application Architecture-oriented?

For products that we have in the

portfolio that come from IBM labs, we are very committed to the SAA strategy, and we will aim to shape the products in that image. If we are going to be in the publishing business, that will be slightly different. We obviously will be very interested in shaping our offering to work with that strategy, but it is not a limiter.

How are you going to get this thing rolling?

We have met with a fairly good number of developers, and basically we have said, "Look. What we can bring to the table is technical support from a development standpoint — either how to work with OS/2 or product plans. We can also provide our view of product trends, development tools like loaner machines, early software tool kits or funding."

Will you provide guidelines to expand the portability of these products to other operating systems?

In some cases, it goes as far as sharing of technology. Some company may have an excellent set of skills in one area but will want to add to their product's communications capability or natural language stuff. Here you can do joint development.

Continued on page 47

Top sellers

Software: Jan. 23-27

1	Lotus' 1-2-3
2	Wordperfect Corp.'s Wordperfect 5.0/4.2
3	Ashton-Tate's Multimate Advantage II
4	IBM's DOS 3.3
5	IBM's Displaywrite 4
6	Delta Technology's Direct Access
7	Fifth Generation Systems' Fastback for the Macintosh
8	DCA and Crosstalk Communications' Crosstalk XVI
9	Ashton-Tate's Dbase III Plus
10	IBM's Fixed Disk Organizer
11	Fifth Generation Systems' Fastback Plus

SOURCE: CORPORATE SOFTWARE, INC.
CW CHART: JOHN YORK

Hypercard clone undergoes beta tests

BY JULIE PITTA
CW STAFF

SAN DIEGO — Beta-test versions of a clone of Apple Computer, Inc.'s Hypercard database for the Macintosh reportedly were shipped to third-party developers and corporate end users last week.

Supercard, Silicon Beach Software, Inc.'s Hypercard clone, is being positioned as a second-generation product compatible with Hypercard, according to a Silicon Beach spokesman.

Like Hypercard, Supercard

allows users to incorporate text, graphics, sound and animation to create personalized databases. Users store information on screen images of "cards" as they would with an index card. The software allows users to organize information by linking cards that are then organized into "stacks."

New wrinkles

However, Supercard adds features that are currently not available in the original package, according to Silicon Beach officials. It supports color, adds a debugger and extends Hypercard's

scripting language Hypertalk. The extension adds new commands for managing windows and menus.

Both products require 1M byte of random-access memory. The color version of Supercard requires 2M bytes of RAM and can only be used in a Mac II, Apple's top-of-the-line system.

Hypercard is bundled with every new Macintosh sold. Users who purchased a Macintosh before Hypercard's introduction in August 1987 may purchase it for \$49. Supercard is priced at \$199.

Industry watchers say it re-

mains to be seen whether Supercard finds a following. Compared with Hypercard, it is expensive, and Silicon Beach lacks the name recognition of Apple.

Mixed success

Also, Supercard's predecessor, Hypercard, has met with mixed success, they said. Average users have found Hypercard difficult to use, and Apple has failed to lure many third parties into developing "stackware" to facilitate the use of Hypercard.

The product adds a number of beneficial features to Hypercard, said Fred Thorlin, director of software industry services at Dataquest, Inc., a San Jose, Calif., market research firm.

However, it may be subject to the same factors that hampered the success of Hypercard, Thorlin noted.

While the Mac community has been excited about Hypercard, few third parties have developed successful stackware, he said. "Apple made a mistake in that it promised Hypercard would be everything to everybody."

John Wordley, an industry analyst at International Data Corp. in Framingham, Mass., said Hypercard has been a tough sell. "A big problem with Hypercard is that it's difficult trying to explain it," Wordley said.

"It's difficult for users to relate to it."

End users

FROM PAGE 43

ment's unique needs. This feedback allows UNUM to better tailor support programs.

UNUM's PC Users Group is made up of equal portions of 20 to 40 "zealots" and systems personnel, Caton said. The company has a second group, called the Key Operator Network, made up of 60 active members and 60 backups who regularly work on office systems and data access networks.

"They are most important as feedback groups to test applications, evaluate products and to preview new technology roll-outs," Caton said.

End-user groups at UNUM and elsewhere also help information center management to select and test new technology, set standards and establish ground rules for applications development by end users.

Market opportunity

One additional benefit is that the regularly held meetings give the information center an opportunity to market its services to end users, Caton said. "We use these meetings to present what we think the industry will do in the year ahead and to give them our position on such things as OS/2 and Presentation Manager," he explained. "It keeps us from getting requests for things we do not plan to move on."

There are several end-user groups at Merrill Lynch & Co. in New York, according to David Hasiba, manager of microcomputer acquisition and maintenance support. "They are a great forum for exchanging ideas, training and enforcing standards," Hasiba said.

Merrill Lynch's Network Administrator Group, composed of about 30 end users responsible for managing the company's local-area networks, meets monthly to learn techniques and to talk about developments in networking technology.

There are several aspects to setting up and managing end-user groups. Perhaps the most critical component of a successful program is the active participation of information center management.

The information technology support team at Merrill Lynch, for example, establishes end-user groups, spells out the groups' objectives and meeting guidelines and is responsible for ensuring that issues raised by the groups are acted on.

Another key to setting up a successful end-user group is promoting a self-driven culture that keeps users motivated and willing to regularly participate in users group activities.

"We tried it for a while, but we couldn't keep it up because there was very little participation," said Warren Harkness, di-

rector of corporate information systems at Bose Corp. in Framingham, Mass. "There is a tendency here for people to seek out the self-professed computer experts whenever they have a problem; they don't want to wait for a meeting that's going to be held a month from now to get what they need."

Getting the support of management is also vital. When

UNUM's information center management team decided to establish an end-user group to provide departmental-level support to end users on the company's networks, it went to the company's chief executive officer to ask that each department manager be required to volunteer an employee for the group. "We mandated their participation because of the rapidity of having to

evaluate and implement technology," Caton said. "We wanted to make sure that we would reap the benefits that we could only get with full participation."

Management's approval is also necessary to permit end users to hold meetings on company time. Without it, the end-user group is doomed to fail, warned several information center managers.

"We had one that was set up by the information center, but once it was started, we wanted users to run it. But the idea died," said Bob Nelson, an end-user computing systems consultant at Harris Bankcorp, Inc. in Chicago. "It needs to have middle management's involvement — for them to say to their employees, 'This meeting is important and you should attend.'"

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Compaq targets techies with graphics board for CAD/CAE

BY JULIE PITTA
CW STAFF

HOUSTON — Compaq Computer Corp. has introduced a graphics board and color

monitor targeted at technical personal computer users such as those involved in computer-aided engineering and design.

The \$1,499 device, called the Compaq Advanced Graphics 1024 board, provides 1,024- by 768-pixel resolution and the ability to display 16 colors from a palette of 16.7 million. It supports Autodesk, Inc.'s Autocad Releases 9 and 10 and drivers for Autosshade and Autosketch as well as Microsoft Corp.'s Windows/286 and 386. It can be plugged into either 8- or 16-bit slots. It is not compatible with IBM's 8514/A graphics adapter.

A companion board — the Advanced Graphics Memory Board — allows the display of 256 colors and a resolution of 1,024 by 768 pixels for shaded three-dimensional images. It costs \$599.

Comaq also introduced a monitor for use with the advanced graphics board.

The Advanced Color Monitor, priced at \$1,999, offers resolution of 1,024 by 768 pixels and IBM Video Graphics Array resolution of 640 by 480 pixels. It supports up to 256 colors on a 16-in. screen.

Compaq claims that a quarter of its Deskpro 386/20 users are running computer-aided design software. The Deskpro 386/20 is positioned near the high end of Compaq's PC line.

Compaq Vice-President of Sales and Marketing Michael Swaveley declined to offer projections on how the new products will allow Compaq to increase its penetration in technical markets.

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Native Code Compiler with fast execution.

- 10x faster computations than MS COBOL 2.2.
- 30% faster I/O than MS COBOL 2.2.

Alexander

CONTINUED FROM PAGE 43

the center's services and objectives through newsletters, Help desks, hot lines, walk-in services and every other tool at your disposal.

Solving problems is more important than selling services; avoid pushing services that end users don't want. Many information center managers are not embarrassed to refer an end user to a PC power user for assistance that the center is unable to provide.

"We have guys here that know more about Lotus' 1-2-3 than we'll ever know," a manager of micro support said to me recently. "They're closer to their jobs than we are, and they know how the tools can be used in their work."

With end users doing more to help themselves, the information center can focus on the truly critical tasks. For example, an information center staffer at a large corporation told me he spends increasing amounts of his time conducting needs analysis for end users. He added that bringing end users into the decision-making process earlier for selecting hardware and software has sped up the cycle and increased their willingness to begin using new technology.

"End users began pushing us for desktop publishing systems, but we weren't ready to do it," he explained. "So, we finally ordered some sample programs and asked a couple of the most vocal end users to evaluate the software and

make recommendations." As a result, end users got what they wanted sooner and, in return, shouldered much of the training and support responsibilities, he said.

Rather than making policies too strict, give end users some option for buying nonstandard products; however, limit support and training to those packages on the approved list.

There is probably little that information center managers can do to stop end users from developing their own applications, despite the potential risks involved. And like it or not, the center will probably have to support those activities. Take control of the conditions under which end users are allowed to develop applications to ward off some of the potential problems. That means setting guidelines for the review, documentation, testing and support of end-user developed applications.

The vice-president of computers and communications at a large railroad company offered this last bit of advice:

"When it comes time for budget-cutting, the IC goes first unless you can show end users what you have done for them. When end users ask for services, ask them to tell you what the job would have cost if they had done it on their own. The day will come when you will need that information, and there is a good possibility that in times of cutbacks, you may be increasing your staff."

Alexander is a *Computerworld* senior editor, microcomputing.

IBM

CONTINUED FROM PAGE 45

Will you focus on so-called horizontal applications?

On the front end, yes, but verticals will be very interesting to use later in the year as a second step.

When will we see the first of these products backed by IBM?

We have several negotiations under way, but I don't want to put time pressure on myself.

Would you care to be vague?

Sometime this year, that is for sure.

What applications areas are you primarily interested in?

Front ends to databases are very important to us, and that is an emerging area, particularly in an OS/2 environment. The Personal Information Manager category and graphics are very appealing, and of course we have a good entry into word processing.

Here, we are interested in products that work around word processing like desktop publishing or page recognition. We are not much interested in spreadsheets. We have some arrangements with Lotus there anyway.

What are your goals? To become "The IBM of software?"

The objective is to build a healthy revenue stream. I would also like to put a set of applications out there that is breaking new ground.

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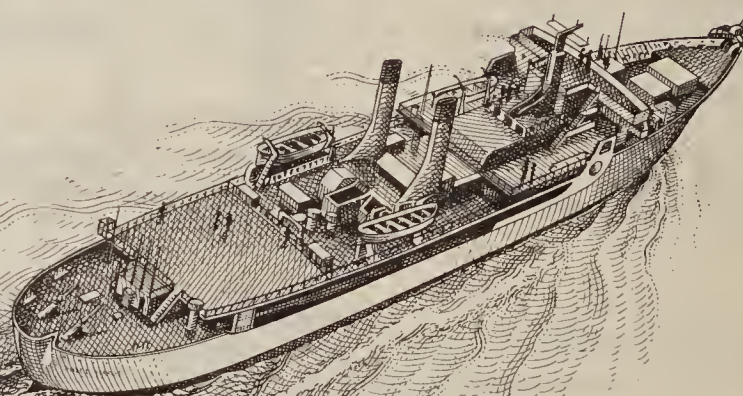
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MCA-EISA

CONTINUED FROM PAGE 43

similar to MCA. "The distinctions are pretty subtle," said Rich Bader, general manager of Intel Corp.'s Personal Computer Enhancement Operation, a group that develops PC board products.

Both buses eliminate annoying DIP switches during board installation and support 32-bit data transfer. In addition, each camp supports multiple processors, a technique called bus mastering. This allows separate processors to take over the bus and simultaneously access memory and disk. So at this fundamental level, the two adversaries agree.

When arguments over technical minutia are put aside, it all boils down to positioning.

IBM says it introduced the Personal System/2 with its MCA to set the stage for a new style of computing in which users will do several things at once and communicate with a wide variety of devices while micro-based servers proliferate.

But first, a new bus was needed, IBM said. And the bus it introduced, MCA, was viewed as closed and proprietary to IBM. This drew howls from its competitors, who used IBM's more open AT bus to steal gobs of market share away from IBM. In fact, the EISA coalition has chosen to rename the AT bus it has cloned to Industry Standard Architecture, or ISA.

IBM's competitors have complained that MCA is unnecessary for single-user machines and that IBM's pro-MCA argument is a nonissue. IBM disagrees and points to an approach called "level-sensitive interrupts" as a potential boon for users. Level-sensitive interrupts replace the so-called edge-triggered interrupts used in the PC AT bus. Simply put, with edge-triggered interrupts, the system essentially handles requests from software and hardware as they occur.

LAN pitching

Because Compaq believes that advanced buses such as MCA and EISA are "useless" for single-user computing, the firm is pitching EISA for \$10,000-to-\$15,000 departmental and local-area network server systems. It is in these applications

alone that advanced buses are required, Compaq said.

There is one outstanding technical difference between EISA and MCA upon which Compaq places great emphasis: EISA will reportedly protect the corporate user's investment in AT bus-compatible add-in hardware. Naturally, IBM has a completely different view of the EISA bus. Chet Heath, senior engineer in the Entry Systems Division and the man widely viewed as the father of MCA, says that EISA simply will not work.

Compaq confidently contends that users can mix yesterday's old modem, graphics cards and networking with tomorrow's coprocessing and bus-mastering cards specifically designed for EISA.

Perhaps, counters IBM's Heath, if you want to roast hot dogs with it. The implications of interrupt-sharing between edge-triggered (AT-compatible) and level-sensitive (32-bit address) devices will eventually lead to disaster, Heath said.

In other words, users who mix old PC AT cards with ones developed specifically for EISA are following a recipe for disaster. "What the user would see is the two devices getting very hot," Heath said. "Eventually, one would burn out. And that's what we call a silicon barbecue."

Compaq's Stimac concedes that Heath is theoretically correct but argues that EISA has taken pains to ensure that the bus cookout never ignites. New EISA boards tell the system how it will generate interrupts and how it will work with other products. Also, existing boards, when installed, go through a configuration utility that provides the same protection, Stimac said.

The bottom line for Heath is that IBM has a massive head start. "We've had for 21 months what the other guys will have 21 months from now," he said.

That doesn't faze Compaq, which points to EISA's support of today's cards and its claims that board makers are working on advanced boards [CW, Jan. 30, 1988]. This combination will let EISA catch up with MCA, Compaq claims.

It is likely that these opposing forces will continue to squabble over petty differences between buses. But like any marketplace wars, customers will ultimately choose the winner.

have access to OS/2 source code. The other two, as you may have guessed, are co-developers IBM and Microsoft.

We're not sure how IBM or the other EISA members feel about this, but we know Compaq is happy. Compaq can work at a very detailed level to ensure that OS/2 embraces the EISA bus' way of supporting multiple processors.

New Mac semiclone. Nobody has fully cloned the Macintosh yet. Several companies such as Phoenix Technologies could do it if someone gave them the proper millions; so far, none has stepped forward.

Atari, however, already has a Mac semiclone that requires users to buy Apple read-only memory. But the 68000 processor in the Atari box doesn't give Mac software much oomph. On the way, however, is an Atari 68030 box with Mac ROMs in plentiful supply from a third party. This speedy, cheap compatible may be just what Mac users have been waiting for.

Barney is a *Computerworld* senior editor, microcomputing.

Bob,



286 bargains

CONTINUED FROM PAGE 43

increased to 35% from a usual 30%, he noted.

Tom Egan, a vice-president at Wells Fargo Bank, said his organization has made the decision to purchase more fully featured 286-based systems. Like Charles Schwab, Wells Fargo is standardizing on 286 technology.

"We're getting more for less," he explained. "We're forcing better deals," a phenomenon he said he took note of only a couple of months ago.

Make your deal now

Bill Lempesis, a PC industry analyst at Dataquest, Inc. in San Jose, Calif., said the first half of this year will be a prime time for users looking for good deals on 286s. An average 286 system is currently selling for about \$2,000. Lempesis said he expects prices to drop between \$1,000 and \$1,500 in the next few months.

About 5.7 million 286-based systems were shipped worldwide last year, Dataquest reported. That figure is expected to climb to 6.5 million this year, according to Dataquest's projections.

Better prices are the result of oversupply. In the beginning, the 286 market attracted clone makers because it offered better margins. As more vendors jumped into the 286 market, users have been the big winners. They have a choice among suppliers who are willing to deal to get their business.

An ease in the scarcity of memory components has also contributed to price reductions, according to Lempesis. "DRAM prices are going down to a certain extent," he said. "But they're not back to where they were before the shortage."

However, the oversupply of 286s has forced vendors to drop prices to compete, despite the higher price of memory. Clone makers such as Wyse Technology are feeling the pressure. Wyse recently reported its first operating loss and blamed its stumble on a failure to drop prices quickly enough to fuel demand in an increasingly competitive market.

Wyse conceded that it has a significant inventory of 286 systems.

Marginal returns

"We're going to continue to see downward pressure on pricing," Lempesis said. "There's an awful lot of competition in the marketplace. Margins will be under pressure."

Vendors are expected to place a greater emphasis on Intel 80386 technology by year's end in a search for better margins. They may find many users unreceptive unless prices for 386 systems drop significantly.

Gordon said Charles Schwab will stick with 286 technology until prices for 386-based systems begin to fall. "It doesn't make sense economically for us to migrate up," Gordon explained. "The price differential between what we're able to get a 286 for right now and a 386 is too great."

Barney

CONTINUED FROM PAGE 45

Many avoid these tribulations by dealing directly with competent vendors. Others seek out and hang onto top-notch dealers. But in just about every case, corporations set up their own dealer-type operations to help end users select and set up products, troubleshoot installed systems and answer technical questions that range from dull to sublime. That is a lot easier than explaining to a dealer what a graphics card is and why it doesn't work.

This problem is going to get a lot worse. There are these things called networks and workstations and OS/2 to worry about. Most dealers will be dumbfounded by this stuff, and MIS will say what it usually says: "Just give me 30 points off and hand me the box."

Hope for EISA. EISA, which is short for Extended Industry Standard Architecture and long on promises, has a saving grace. Compaq, the ringleader of the group, is one of three companies that

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NEW PRODUCTS

Training

Rapid Systems, Inc. has introduced a library of personal computer-based **lab courses** that were designed to provide comprehensive coverage of digital instrumentation and digital signal processing techniques.

The lab programs run on IBM Personal



Rapid's lab course software

Computers and PC XT's and AT's. The courses consist of both hardware and software to convert a PC into a turnkey digital oscilloscope, spectrum analyzer, data logger or data acquisition model.

Pricing for the products ranges from \$995 to \$3,995.

Rapid Systems, 433 N. 34th St., Seattle, Wash. 98103. 206-547-8311.

Nostradamus, Inc. has released **Quattro-Assist 1.0**, a tutorial for Borland International's Quattro spreadsheet package.

According to the company, Quattro-Assist 1.0 covers several topics, including data entry, spreadsheet functions, graphing and macros. The tutorial has a price tag of \$79.95.

Nostradamus, Suite 252, 3191 S. Valley St., Salt Lake City, Utah 84109. 801-487-9662.

Microvideo Learning Systems has developed a training program for users of Ashton-Tate Corp.'s Dbase IV software program.

The package reportedly consists of two modules: the **Using Dbase IV Learning System** and the **Advanced Dbase IV Learning System**. Both units utilize a videotape, a data diskette and an in-depth workbook, the vendor said.

The modules may be purchased together for \$895 or separately for \$495 each. Videotapes are available in either VHS or Beta formats, according to the company.

Microvideo, 119 W. 22nd St., New York, N.Y. 10011. 800-231-4021.

Data storage

Practical Computer Technologies, Inc. has announced a series of add-on, floppy drive subsystems for users of IBM Personal Computers, PC XT's and AT's and compatible machines.

The **Practidisk** product line includes a proprietary controller that is reportedly capable of coexisting with the computer's currently installed controller and drives. Available in both external and internal versions and in configurations for 3½-in. and 5¼-in. disks, the series is priced from \$179 to \$489.

Practical Computer Technologies, 3971 Walnut St., Fairfax, Va. 22030. 703-385-3332.

Priam Corp. has integrated its Inner-space family of high-capacity Winchester disk drives with the small computer systems interface (SCSI) for IBM Personal Computers, PC AT's, Personal System/2's and compatible systems.

The company has added 160M-, 250M- and 330M-byte SCSI drives to its line of internal disk add-in kits. The **ID160**, **ID250** and **ID330** kits reportedly include a disk drive, mounting hardware, cables, installation manual and partitioning software on a floppy diskette. They are priced from \$2,195 to \$3,255.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134. 408-434-9300.

Grid Systems Corp. has announced a 100M-byte Winchester disk drive option for the company's line of Intel Corp. 80286- and 80386-based laptop computers.

The 3½-in. **Model 325** drive reportedly uses four disks and eight heads and has a 28-msec access time. It has 104M bytes of formatted capacity, according to the company, and can store approximately 50,000 pages of typed material.

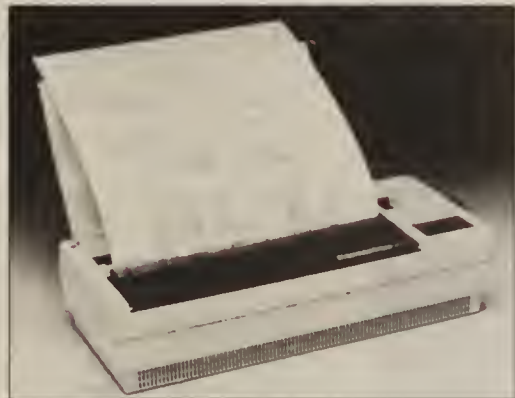
The Model 325 has a price tag of \$2,895.

Grid, 47211 Lakeview Blvd., Fremont, Calif. 94538. 415-656-4700.

Peripherals

Toshiba Corp.'s Information Systems Division has introduced the **Expresswriter301**, a portable printer that provides 24-dot letter-quality printing, the company said.

The four-pound printer includes 2K bytes of memory and prints at 60 char./sec. in high-speed mode and 42 char./sec.



Toshiba's Expresswriter301 printer

in normal mode, according to the company.

The Expresswriter301 is priced at \$489.

Toshiba, 9740 Irvine Blvd., Irvine, Calif. 92718. 714-583-3000.

NEC Information Systems, Inc. has introduced the **Silentwriter LC 890XL** page printer, developed for graphics production in multiuser, local-area networked environments.

The device features Adobe Systems, Inc. Postscript support as well as a Motorola, Inc. 68020-based Atlas controller, also from Adobe. The printer offers 4M bytes of random-access memory, which is expandable to 8M bytes, according to the company. A 20M-byte external hard disk drive may be purchased as an option.

The LC 890XL has a price tag of \$6,995. Shipments are scheduled for March.

NEC, 1414 Massachusetts Ave., Boxboro, Mass. 01719. 508-264-8000.

I think we've
got a problem
with the printers
in accounting.



Mitsubishi International Corp. has introduced the **Intelligent Graphics Controller**.

The controller comes standard with the company's CHC 336 thermal color printer and reportedly allows the printer to interface with almost any computer's graphics system. The product does not require custom-written software drivers and is especially suitable for the personal computer and desktop publishing marketplace, according to the company.

The CHC 336 costs \$6,300.

Mitsubishi, Computer Graphics Department, 701 Westchester Ave., White Plains, N.Y. 10604. 914-997-4999.

A series of image scanners has been introduced by **Complete PC, Inc.**

The **Complete Page Scanner** reportedly offers sheet-fed scanning of full 8½-in. wide pages up to 14 in. long. Users may select either 200 or 300 dot/in. resolution, and the product includes an interface card for Microsoft Corp. MS-DOS personal computers. The scanner costs \$899.

According to the vendor, the **Complete Hand Scanner/400** scans at resolutions of 200, 300 or 400 dot/in. Especially suited for use with desktop publishing and word processing packages, the unit costs \$249.

The **Complete Half-Page Scanner** can cover a page in two scanning passes, the company said, and scans images up to 4 by 14 in. at 200 dot/in. It costs \$299.

Complete PC, 521 Cottonwood Drive, Milpitas, Calif. 95035. 408-434-0145.

Sharp Electronics Corp. has reportedly expanded the capabilities of the **Wizard**, the company's handheld electronic organizer.

The product is said to provide a database facility especially suited to traveling executives. According to the vendor, the unit can transfer data to desktop personal computers as well as hard-copy devices.



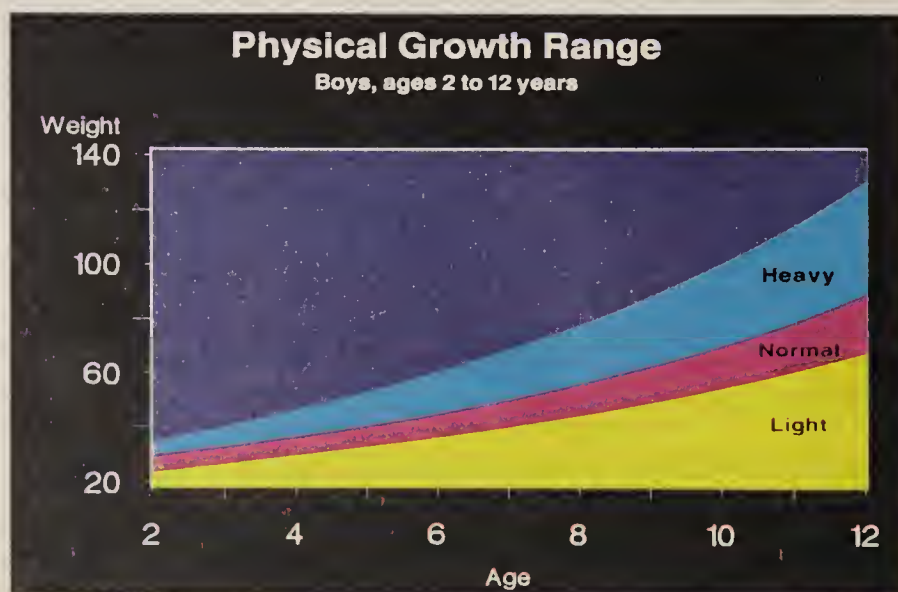
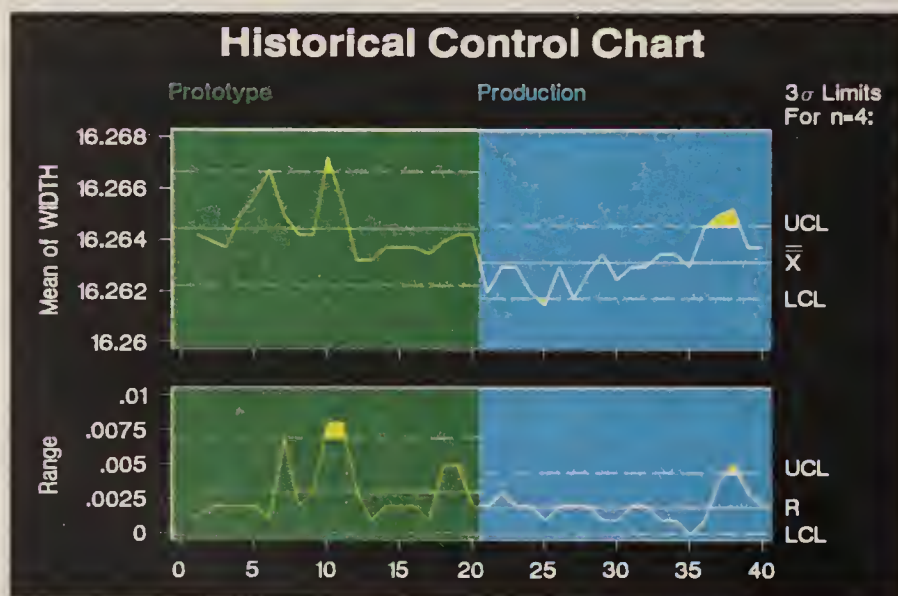
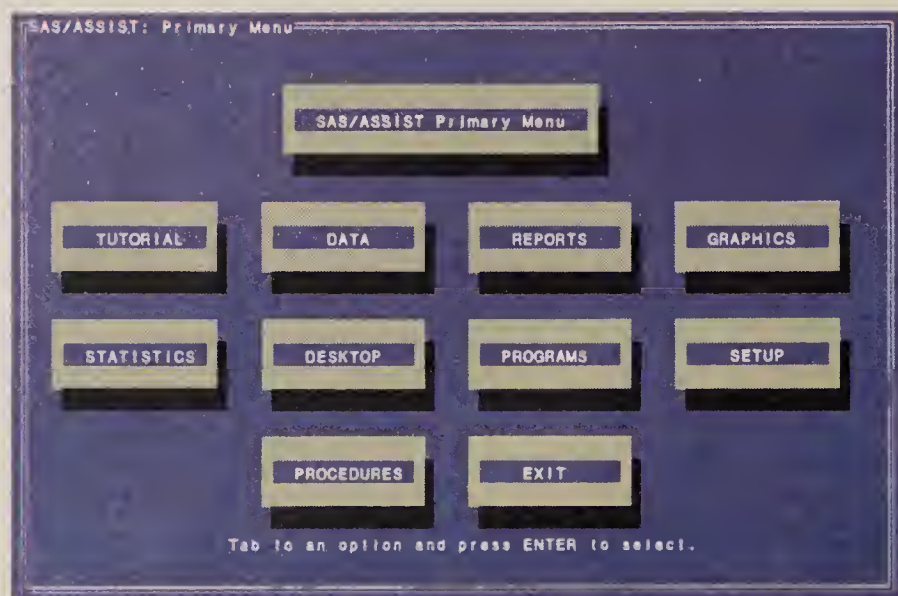
Sharp's Wizard electronic organizer

The organizer also offers optional peripherals, including a PC link, software diskette and printer and dubbing cable. Integrated circuit software cards are available.

The Wizard costs \$299. Options are priced separately.

Sharp, Sharp Plaza, Mahwah, N.J. 07430. 201-529-8874.

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Systems

An IBM Personal Computer XT-compatible system developed specifically for novice users has been introduced by **Vendex Technologies, Inc.**

The **Headstart Plus** reportedly operates at a rate of 9.54 MHz and comes standard with 640K bytes of random-access memory, two 360K-byte 5¼-in. floppy disk drives and Microsoft Corp. MS-DOS 3.3.

The unit will accept an optional hard disk drive, and the customer has the choice of either a color or monochrome monitor.

Headstart Plus is priced at \$995, excluding the monitor.

Vendex, Suite 438, 40 Cutter Mill Road, Great Neck, N.Y. 11021. 516-482-4255.

A family of Intel Corp. 80386-based systems has been introduced by **Micro Express**.

The **ME 386-20** and the **ME 386-25**, with speeds of 20 MHz and 25 MHz, respectively, are said to be IBM Personal Computer AT-compatible and especially suited for networking or multiuser applications. Standard configurations include 1M byte of random-access memory, a



Micro Express' ME 386-20 and 25

40M-byte fast-access hard disk drive, serial and parallel ports and a battery back-up.

The ME 386-20 is priced from \$2,650, while the ME 386-25 is priced from \$3,995.

Micro Express, 2114 S. Grand Ave., Santa Ana, Calif. 92705. 714-662-1973.

Software applications packages

Database Applications, Inc. has announced a business and scientific graphics product for IBM Personal Computers and compatibles.

Called **DR&G**, the package is driven entirely by fourth-generation language statements and combines graphics with tabular reporting, mail merge and SQL-like queries of relational databases, the vendor said. There are several chart formats to choose from, and up to six data sets can be plotted at once. Other features include automatic scaling, 33 hatch and line patterns and up to 128 colors.

DR&G costs \$179.

Database Applications, 400 Wall St., Princeton, N.J. 08540. 609-924-2900.

An analytical software package for market research suppliers and buyers has been announced by **Market Action Research Software, Inc.**

Called **Mapwise**, the package reportedly analyzes research tables for presentation in boardroom-quality graphic formats.

The product will transform any type of tabular data into a perceptual map, the vendor said, and can summarize up to 100 rows and 100 columns of data.

Mapwise costs \$495 and requires an IBM Personal Computer, PC XT or AT or compatible system with 256K bytes of random-access memory.

Market Action, Business Technology Center, Bradley University, Peoria, Ill. 61625. 309-677-3299.

A presentation design program that incorporates tools for project prototyping and interactive tutorials has been announced by **Genesis Data Systems**.

Running on IBM Personal Computers, Personal System/2s and compatible computers, the **Rapid Prototyping System (RPS)** reportedly allows users to manipulate text and graphics through the use of animation, transition, branch, subroutine and numeric/text variable commands.

RPS costs \$249.95 and requires 256K bytes of memory.

Genesis Data Systems, Suite A, 8415 Washington Place N.E., Albuquerque, N.M. 87113. 505-821-9425.

Macola, Inc. has released three software packages that were specifically developed to integrate with Autodesk, Inc.'s Autocad design systems, according to the vendor.

The software is part of the company's Rapid Modeling Platform (Ramp) product line and reportedly allows users to convert a simple center-line drawing to a three-dimensional model via a personal computer.

The packages consist of **Ramp Piping Design**, **Ramp HVAC Design** and the **Ramp Equipment Builder**. They are priced at \$2,095 each.

Macola, P.O. Box 485, Marion, Ohio 43302. 614-382-5999.

Accel Technologies, Inc. has introduced the **Series II** versions of **Tango-PCB**, the company's IBM Personal Computer-based electronic design software, and **Tango-Route**, its companion auto-router program.

Series II enhancements reportedly include an improved menu-driven user interface, an on-screen Prompt line and user-definable macros.

The software packages are priced at \$595 each, which includes one year of free updates, according to the firm.

Accel, 7358 Trade St., San Diego, Calif. 92121. 619-695-2000.

A maintenance management software package for plant engineering and machinery maintenance functions has been announced by **DP Solutions, Inc.**

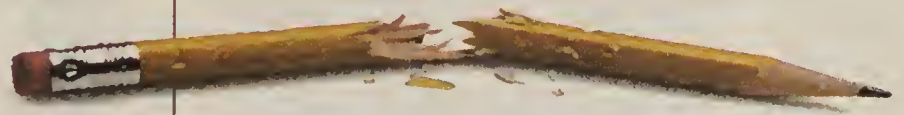
Preventative Maintenance Control (PMC) Version 2.5 reportedly provides scheduled maintenance by either time frequency or equipment run hours.

Other features include printed work orders, labor and spare-parts forecasting and purchase order and requisition tracking. The program runs on IBM Personal Computers and compatibles and the IBM System/36 mid-range system.

PMC 2.5 is priced from \$2,000 to \$10,000, depending on configuration.

DP Solutions, Suite M, 207 S. Westgate Drive, Greensboro, N.C. 27407. 919-854-7700.

And in the rest of the company.



Pagebuilder, a graphics-based desktop publishing package for IBM Personal Computer XTs, PC ATs and compatibles, is now available exclusively from **CSI Publishing, Inc.**

The program reportedly includes image-scanning capabilities for logos and photographs and incorporates 16 Compu-graphic Corp. fonts. The software runs on

sensation applications. All dimensioning techniques reportedly follow ANSI and International Standards Organization standards.

Cadvance 3.0 is priced at \$2,995.

Isicad, P.O. Box 61022, 1920 W. Corporate Way, Anaheim, Calif. 92803. 714-533-8910.

A business forms processing software program is now available from **Delrina Technology, Inc.**

Per:Form reportedly allows users to design, create and maintain business forms in a Microsoft Corp. MS-DOS environment.

Offered in both 3½- and 5¼-in. disk formats, the program costs \$259.95, the company said.

Delrina, Suite 210, 10 Brentcliffe Road, Ont., Canada M4G 3Y2. 416-423-0456.

Digi-Fonts, Inc. has introduced a library of fonts for Hewlett-Packard Co.'s Laserjet printer family.

Fontmaker includes up to 272 scalable typefaces and will create any font in portrait or landscape orientation with complete or partial character sets, according to the company.

The basic set, including eight scalable typefaces and a converter program, costs \$69.95. The complete library offers an additional 264 typefaces and is priced at \$349.95.

Digi-Fonts, Suite 285, 3000 Youngfield St., Lakewood, Colo. 90215. 800-242-5665.



CSI Publishing's Pagebuilder

four disks and comes with documentation, according to the company.

Pagebuilder costs \$300.

CSI Publishing, 2960 S. Daimler, Santa Ana, Calif. 92705. 714-955-2232.

Isicad, Inc. has released an enhanced version of its IBM Personal Computer-based computer-aided design package.

Cadvance 3.0 includes an on-screen three-dimensional Visual Guidance System (VGS) that provides a visual reference as the user draws, the vendor said. The package also incorporates a three-dimensional database for design and pre-



Attachmate Corporation, Bellevue, Washington, has trademarked EXTRA! Connectivity Software. IBM is a registered trademark of International Business Machines Corporation

Harry Houdini had one theory anyone could appreciate: If you want to stay out of a bind, you've got to be flexible.

We agree. In fact, that theory is exactly what's behind EXTRA! Connectivity Software.[™]

For instance, if you're currently linked via coax or modem but you plan to switch to a LAN, EXTRA! gives you the freedom to connect all three ways. And that includes LANs using IBM's Token-Ring Interface Coupler (TIC).

It's flexibility like this that prompted PC Magazine to name EXTRA! as its Editor's Choice for PC-to-host software running on LANs.

There's something else we don't want you to forget about EXTRA! It's your memory. EXTRA! uses so little of it, you'll have plenty of RAM left on your PC.

Plus, Attachmate's devotion to total IBM® compatibility assures you that you'll never get dead-ended by proprietary protocols.

Which reminds us of something else Houdini used to say, "Don't get into anything you can't get out of later."



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1-800-426-6283
In Washington state: 206-644-4010

Presenting The Houdini Theory Of Micro-To-Mainframe Connectivity.

Software utilities

Tools and Techniques, Inc. has upgraded its data conversion and data entry software tool for IBM Personal Computers, Personal System/2s and compatibles.

Data Junction 2.1 was designed to translate incompatible data from one format to another and has been enhanced to include Help, Prompt and contextual data information for the user. The program is priced at \$195 and requires Microsoft Corp. MS-DOS or IBM PC-DOS 2.0 or higher.

Tools and Techniques, 1620 W. 12th St., Austin, Texas 78703. 512-482-0824.

A terminate-and-stay resident program for Ashton-Tate Corp.'s Dbase III, Dbase III Plus and Dbase IV users has been introduced by **Isogon Corp.**

Called **Dboost**, the package uses between 16K and 64K bytes of expanded memory and is available for \$69.95.

The company is also shipping **4-Sure**, an add-in product for Lotus Development Corp.'s 1-2-3 spreadsheet package. According to the vendor, 4-Sure prevents accidental loss of the current spreadsheet and features user command monitoring and Autosave functions. The package is priced at \$39.95.

Isogon, 330 Seventh Ave., New York, N.Y. 10001. 212-967-2424.

Macintosh products

Digital Vision, Inc. has begun shipping an Apple Computer, Inc. Macintosh version of its gray-scale video digitizer.

Computereyes for the Macintosh is reported to be a combination hardware and software package that connects between the computer and any standard video source, including video cameras, videocassette recorders and disk players. The system offers 256 shades of gray and is especially suited for desktop publishing and presentation and animation applications, according to the vendor.

The unit is priced at \$249.95.

Digital Vision, 66 Eastern Ave., Dedham, Mass. 02026. 617-329-5400.

A **computer slide imaging service** for Apple Computer, Inc. Macintosh users is now available from **Jack Ward Color Service, Inc.**

According to the vendor, the imaging center promises to deliver boardroom-quality slides and transparencies and is open 24 hours a day. Files may be transmitted by modem, and slides are priced from \$3.95.

Jack Ward Color Service, 220 E. 23rd St., New York, N.Y. 10010. 800-342-5420.

Avalon Development Corp. has begun shipping **Photomac**, its full-color photodesign software for Apple Computer, Inc. Macintosh II machines.

Targeted at graphic design and corporate electronic publishing professionals, the product provides low-cost methods of photo retouching and process color separations, according to the company.

The package includes program and image disks, documentation and a tutorial videotape. It is priced at \$695.

A 40M-byte hard disk and 2M bytes of random-access memory are required for operation, the vendor said.

The product is distributed through Data Translation, Inc., 100 Locke Drive, Marlboro, Mass. 01752. 508-481-3700.

Board-level devices

A printed-circuit board that measures computer usage is now available from **Benta**.

The **Utilog II** reportedly provides monitoring and accounting information for IBM Personal Computers and compatible systems and is offered in

two versions.

The Model 1 provides a real-time clock and monitoring of total usage time and is priced at \$195. The Model 2 contains all Model 1 capabilities as well as monitoring facilities for printer, disk and keyboard functions. It costs \$295.

Benta, 12708 E. 62 Court, Kansas City, Mo. 64133. 816-353-3765.

Why didn't we go with HP in the first place?



Unlike Bob, some DP/MIS managers make it easy on themselves.

They set up their accountants with HP's 24-wire Rugged-Writer printer, the one with a 20,000-hour MTBF rating. And things are going well.

They give Marketing the elegance of a LaserJet

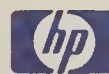
printer, the industry standard for years. They show Sales how quickly bulk mailings can go with the advanced LaserJet IID printer. And things are going well.

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M I C R O
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PC options aplenty at show

CW STAFF

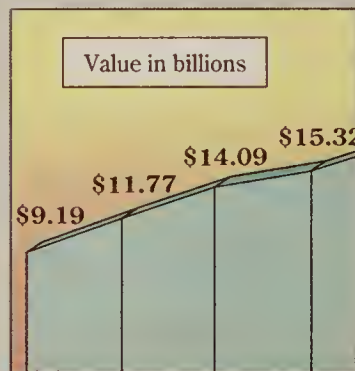
• A hardware and software produced specifically to design and business presentations is scheduled to be wooing PC users with graphics options, expansion capabilities and enhanced security features. The products, and has signed up

Data View

Program training

CW STAFF

Put a bunch of personal computer users in a room and eventually they will duplicate every application ever written for themselves



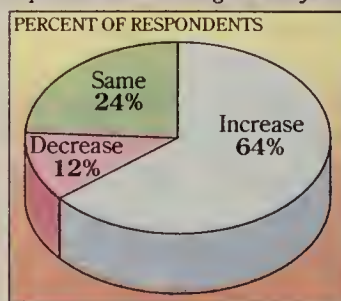
same time, they will create even their departments. At the formation center manager down the hall.

Thanks to the proliferation of personal computers and a rise in computer literacy, more end users than ever are creating applications, databases, spreadsheets and other programs. The appli-

N E W S

Get out the checkbooks

Survey of 240 information systems executives indicates large majority expects increased budgets next year



CW CHART

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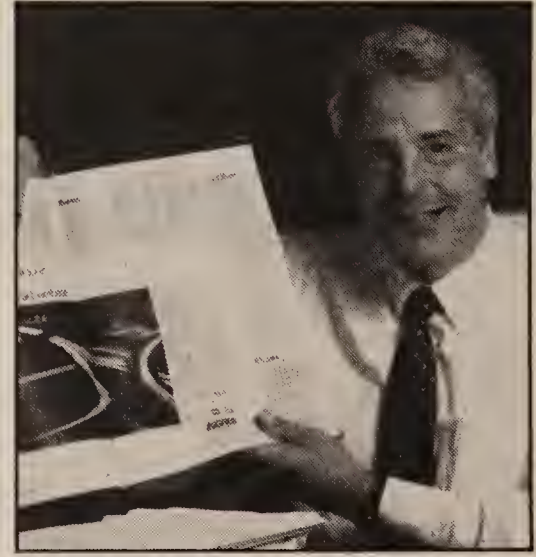
It may turn out to be the best business news you'll get all day.

IBM



"...We know Computerworld reaches more decision makers in more of our target markets. And we know it's working."

— Bob Healy
Vice President/Marketing
Relational Technology



Relational Technology, based in Alameda, California, was one of the first companies to be devoted solely to the relational database market. And with its INGRES family of products—the most advanced distributed data management and application development system portable to all major computers—installed in over 8,000 systems worldwide, Marketing Vice President Bob Healy likes what he sees.

He also likes the fact that last year the company enjoyed a 90 percent jump in sales over 1986. Bob says this success comes from positioning a quality product in the right place at the right time in a dynamic marketplace. And the right place for ad-

vertising, he explains, is *Computerworld*.

"We advertise to build brand recognition — and to position our products clearly in a buying marketplace. With the types of products we market, we're not going for immediate responses to every ad. We just want potential customers to think of us when they need relational database tools.

"To accomplish this, we've made *Computerworld* our flagship advertising vehicle. We chose it because we know *Computerworld* reaches more decision makers in more of our target markets. From MIS/DP management to general manage-

ment — and at all levels — it's read by the people who are doing the buying.

"And we know it's working. Studies have proven that our *Computerworld* advertising is creating higher reader recall — and that's exactly what we want. So for the future, *Computerworld* will continue to be our principal vehicle for getting our advertising message across."

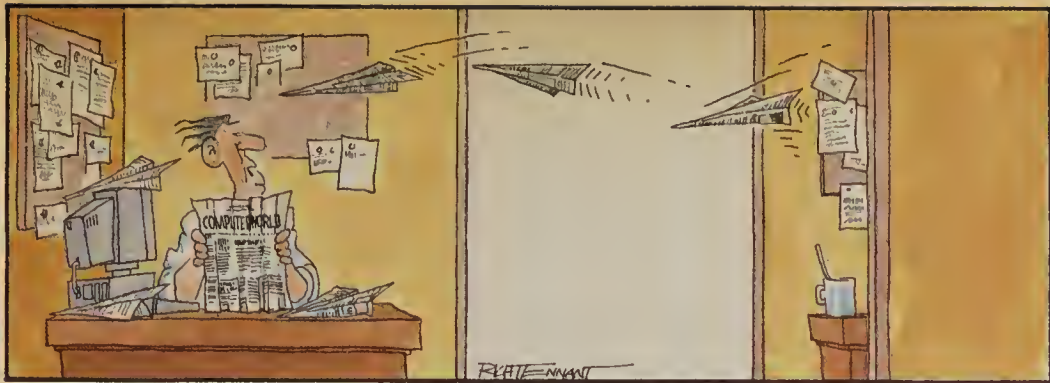
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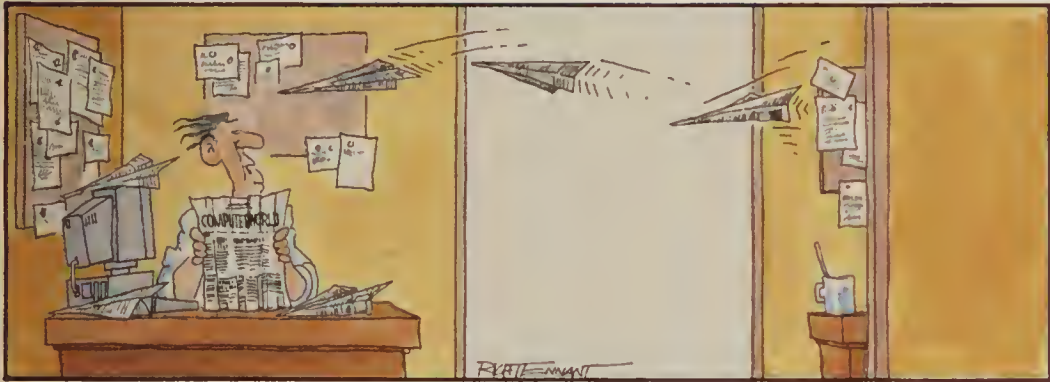
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23. Dir. Mgr. Suprv. Analyst. of Systems
31. Dir. Mgr. Suprv. of Programming
32. Programmer, Methods Analyst
35. Dir. Mgr. Suprv. QA/WP
38. Data Comm. Network/Systems Mgt
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E. Office Automation Systems
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65. Communications Systems/Public Utilities/Transportation
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NETWORKING

DATA STREAM

Tony Friscia

Enablers will bloom on plant floor



The next step in the evolution of computer-integrated manufacturing may be enablers — customizable applications that can be fine-tuned to meet plant managers' needs.

The tool/enabler concept is becoming the foundation of the plant-floor software market. Plant managers do not want canned applications that cannot be modified, configured or tuned — for example, a manufacturing resource planning package that limits parts identification to eight numbers and does not permit the use of letters. Instead, managers want to be able to customize applications that control and coordinate cells — groups of plant-floor devices that work together on a given component or process.

This demand is being addressed from two market directions. Leading cell controller vendors are coming out with platforms designed to make it easier for manufacturing and process people to create their own applications. Also, existing enablers such as Lotus' 1-2-3 are being modified to address the manufacturing environment.

IBM's Distributed Automation Edition and DEC's Digital Systems Architecture are two good examples of cell controller

Continued on page 60

Novell to polish SNA gateway

BY PATRICIA KEEFE
CW STAFF

Early users of Novell, Inc.'s Netware SNA Gateway product line are a diverse but generally satisfied group on the verge of seeing their few caveats eliminated by forthcoming upgrades.

Following beta tests at 40 sites, the Provo, Utah-based vendor began shipping gateways last month for IBM's Systems Network Architecture.

Host channel attachment, reliability and the ability to handle up to 40 sessions were purchasing reasons for beta testers such as Steven Stoneman at Unisys Corp., which has a facilities management contract with the U.S. Environmental Protection Agency, and Don Broughton, a technology consultant at Technical Services Plan, a division of Dun & Bradstreet Corp.

Novell's gateways talk to IBM's Token-Ring Interface Coupler, or TIC — a directly addressable node on IBM's Token-

Ring and several controllers that provides a high-speed link to the host, eliminating the need for a coaxial or Synchronous Data Link Control (SDLC) line.

As a result, instead of having 56K or 9.6K bit/sec. SDLC lines, the EPA has attained "almost" channel-attach speed, said Stoneman, a local-area network systems manager for Unisys. Also, his gateways have been running 24 hours a day with "super reliability," he said.

"We wanted a gateway that provided channel-attach-type speed, and we chose the 40-session gateway," Broughton said. He could have gone the Token-Ring attachment route, but "we didn't want to make the investment in IBM software and hardware," he said.

Instead, the 40-session gateway has saved the cost of 40 separate connections while also providing the flexibility to configure those sessions any way he wants. "The LAN administrator can configure the sessions rather

than having to ask MIS to make the changes," Broughton said.

Future versions of the gateway software will correct two problems: file transfer speed and memory overhead on the workstation, confirmed Darrell Miller, general manager of Novell's Communications Division.

Ironically, Novell's release last month of source-routing drivers jointly developed with Ungermann-Bass, Inc. [CW, Jan. 30] may push some Netware users toward IBM's Token-Ring

gateway, said to be the faster of the two.

Stoneman looked at the IBM gateway a year ago. But the EPA was already linking a large number of LANs together with Novell's software, which at the time did not support IBM's source routing. This forced the EPA to stick with Novell, he explained. "The IBM gateway's file transfer is so much faster than Novell's gateway," Stoneman said.

Despite the source-routing drivers, he said he will wait for Phase II of the Netware SNA gateway — said to be four times faster than the current product

Continued on page 63

Users fear EDI union

U.S.-Europe hybrid poses migration quandary

BY ELISABETH HORWITT
CW STAFF

A transatlantic movement to merge European and U.S. electronic data interchange (EDI) standards is generating conflict and anxiety among various user and industry standards bodies that are implementing older versions of the standard.

The idea behind EDI is to standardize the formatting of commonly used business documents such as invoices and shipping notices so that they can be sent directly from one business computer to another system.

The International Standards Organization has released the first few pieces of a proposed worldwide EDI standard called EDI for Administration, Commerce and Transport (EDIFACT). The standard is designed to supersede both ANSI X.12, which has emerged as the U.S. EDI standard, and the Article Numbering Association's Tradacoms, which is widely used in Europe.

However, on both sides of the Atlantic, user organizations — particularly U.S. companies that have recently begun migrating to X.12 — are reluctant to migrate to EDIFACT, according to Victor Wheatman, manager of EDI Planning Services at Moun-

tain View, Calif.-based research company Input.

"It would be nice to have one EDI standard, but it would also be nice to have the whole world

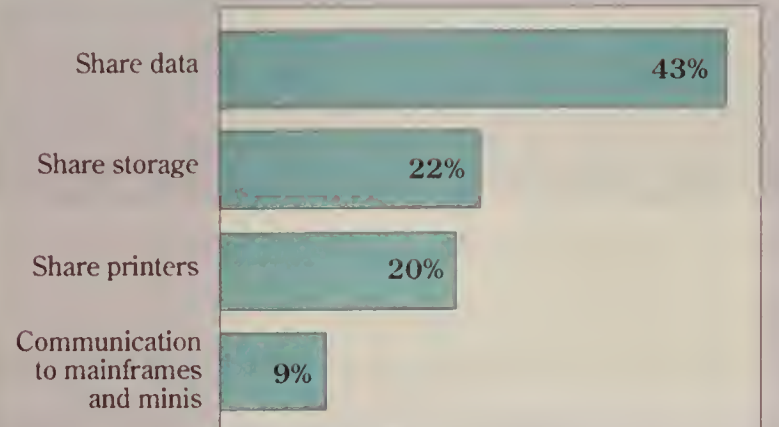
Continued on page 64

Data View

Why buy a PC LAN?

The major reason is to share data, according to a survey of purchase decision makers at 150 organizations

PERCENT OF WEIGHTED RESPONSES*



* Respondents rated their reasons for buying PC LANs on a scale of 1 to 3 (3 = a primary reason, 2 = a secondary, 1 = tertiary); scores were totaled, and the percent of total points that each reason received was determined

SOURCE: INFONETICS, INC.
CW CHART: JOHN YORK

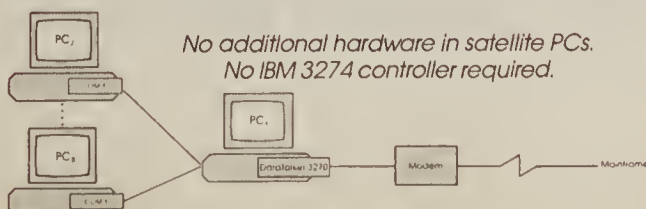
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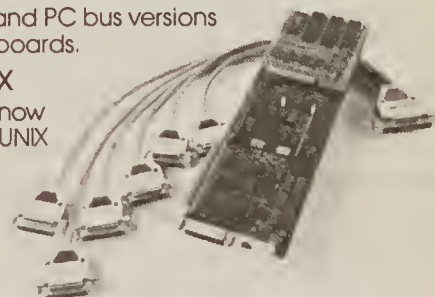
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Friscia

CONTINUED FROM PAGE 59

platforms. Such offerings include various software tools for tailoring applications to a given manufacturing environment, including enablers for process application development, a common applications programming interface and programming tools.

Platform vendors also may provide device enablers, which allow integrators to easily link foreign devices to write custom interfaces for each. For example, Hewlett-Packard's Device Interface System (DIS) can be used to develop protocols, drivers or interfaces for any RS-232-supported device to an HP 9000 Series 800 computer. With DIS, the user can replace one brand of programmable controller with another without rewriting the application.

One advantage of existing enablers is that they provide a familiar environment in which users can develop their applications. General Motors is working with Lotus to develop a version of 1-2-3 for Manufacturing Automation Protocol (MAP) networks called 1-2-3MAP. Initially, 1-2-3MAP users will be able to "read" variables from any MAP node — programmable controllers, robots or data collection devices, for example — into a spreadsheet. Likely enhancements include a file transfer capability for uploading and downloading programs. Note that 1-2-3MAP will provide real-time analysis, not control, of programmable devices.

A step toward applications

MAP's primary drawback has been the lack of applications. So the Lotus products mark an important step for MAP from a technology to an application focus.

Regardless of the chosen network, however, we are also at the beginning of a wave of enabler offerings. The plant-floor market has great potential not only for Lotus but also for its general-purpose PC software competitors. There are several advanced-user companies that have courses for hourly plant employees on "how to write your own applications" using 1-2-3 or Ashton-Tate's Dbase.

As one user said, "It would be great if I could obtain all my plant-floor data coming over the network in a spreadsheet form. Every variable would be listed in a row and every node on the network in a column."

The network enabler is another existing software tool that should soon make it easier for users to mix and match computers on the factory floor. For example, Microsoft's OS/2 LAN Manager can support a host of PCs, workstations and minicomputers running different operating systems and network protocols. The need exists to extend LAN Manager's reach to the factory floor by adding support for real-time database management systems as well as of the MAP protocol, Manufacturing Message Service.

The enabler revolution on the factory floor has only just begun. But users can expect to see plant-floor software companies such as Intellution and Indelec and cell-control vendors such as Allen Bradley and Motorola Computer X team with Lotus, Ashton-Tate and Microsoft to further address this market.

Friscia is president of Advanced Manufacturing Research, a Salem, Mass.-based research and consulting firm.

Taking the sting out of the byte

Connectivity vendors reducing memory glut of LANs for DOS users

BY PATRICIA KEEFE
CW STAFF

The 640K-byte barrier — that proverbial thorn in the side of many DOS users — is rearing its ugly head on the local-area network. In response, a number of connectivity vendors have begun bowing to user pressure to shrink their memory overhead.

The memory issue — or rather, the lack of sufficient memory — remains an inherent weakness of DOS. Stand-alone power users hoping to reap the benefits of

windowing while utilizing a number of packages have long lamented DOS' 640K-byte limitation.

These same users linked together in a LAN may find their memory constraints stretched to the maximum. This is because the network applications have to reside in the DOS shell, noted Mark Freund, a network consultant at Interconnect Consulting Group in Pasadena, Calif.

Consequently, "by the time you get the network operating system and the workstation software loaded, you're limited in the amount of memory that's left

for the application," complained Robin Melrose, a senior system programmer at the systems resource management department at Wells Fargo Bank in San Francisco.

This creates problems for sites such as Wells Fargo that prefer to have emulation capability resident on each workstation. With so many packages "gone wild with memory," he noted, users may be forced to unload some programs where this was previously not necessary.

"They've gotten used to that. So when you give them a new application, and they can't toggle back and forth, they get rather upset," Melrose said.

As a result, memory requirements are becoming a purchasing consideration. "The LAN operating systems have got to

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be cut down in size," Melrose said, adding that both 3Com Corp. and Novell, Inc. are doing just that.

A separate but related issue involves sufficient storage and the trade-off between slapping in another disk and system throughput. This is a particular problem for users who build a lot of databases, said Clare Fleig, director of research at International Technology Group in Los Altos, Calif.

Cutting back on memory-hogging

Reducing overhead can be done. "This is what leads to RISC, or using fewer instructions to do the same job, on the hardware side," Fleig said. Among the strategies being employed to cut back on the memory-hogging are the following:

- Utilize optimal compilers. "You can usually get at least a 25% to 30% reduction by using one of these," said Darrell Miller, general manager of Novell's Communications Division.
- Optimize memory management routines. Instead of statically allocating or preassigning memory, some workstation emulators can dynamically allocate space "so you reuse areas of memory as you need them," Miller said.
- Build intelligent cards. Vendors can situate diagnostics and the lower level networking protocols in hardware rather than in memory. This results in having the intelligence on the hardware instead of having the handshake of protocols occur in the software on the computer, said Gail James, president of Lanquest Group

in Santa Clara, Calif.

The icing on the cake for vendors executing these methods for preserving memory is that they should also be able to improve performance and throughput in terms of the number of packets and messages handled across the LAN, James said.

As for users, one coping mechanism is to purchase extended memory boards, such as those based on the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification. "What people are really working toward is how to take advantage of LIM to let applications, terminal emulation or portions of the network operating system reside up in the non-DOS-accessible area above 640K bytes," James explained.

Users doubt BOCs' intent

BY ELISABETH HORWITT
CW STAFF

Despite regulatory measures such as Open Network Architecture (ONA), users continue to harbor strong reservations about whether the former Bell operating companies (BOC) are moving to meet their networking needs more effectively.

Postdivestiture times have brought "a great deal more flexibility in terms of solutions to corporate communications problems," admitted Kenneth Phillips, chairman of the Committee of Corporate Telecommunications Users and a vice-president at Citicorp. The Federal Communications Commission's ONA ruling has not met its stated goal of ensuring uniformity among the different BOCs' regional offerings, Phillips said.

"What's good for the goose in Nynex territory is not necessarily good for the gander in US West territory," he said. Various regional carriers are "functioning on different marketing plans and product development tracks," which is a major concern to large users who want to ensure that a given service is provided ubiquitously to all their sites, he added.

Package deal

Another objection Phillips voiced focused on regional carriers' tendency to make certain crucial services available only as portions of a larger service package. "In order to buy a pair of tires you have to buy the whole car," he said.

Phillips also said he perceives a danger in the operating companies' recent strategy of positioning themselves as gateways to a variety of value-added services such as electronic mail and database services. "This is problematical for large users," particularly those in rural sites who may end up paying exorbitant rates for the right to use the regional carrier's local connection, he said.

Edward Hodgson, computing and communications manager at Westinghouse Electric Corp., agreed with Phillips that each operating company "is going its own way in terms of what services to supply and how." ISDN will hopefully bring some standardization of the companies' offerings — but "with AT&T no longer a strong arm to guide things, services like ISDN are slow to come," Hodgson said, because rapid conversion to the new technology would not be profitable to the firms.

On the other hand, AT&T and the operating companies have emerged from a chaotic period right after divestiture and are beginning to work together effectively to provide communications services, Hodgson said.

Dennis Murphy, director of telecommunications at Warner Communications, Inc., said he would like to see the companies offer more services than they do currently — but in areas such as voice mail, which are logical product offerings for the companies.

"I also think they have to keep in mind that service quality is a key criterion; it could be a problem as some try to move off into some areas at the expense of dial-tone service," Murphy said.



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Show focus: Better LAN control

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — Product introductions at this week's Communication Networks '89 conference aim to satisfy users' increasing demand for more reliable and controllable local-area networks.

"The network diagnostics market is growing very, very quickly," said Doug Gold, manager of the communications industry research program at International Data Corp. in Framingham, Mass. "We are seeing interest in almost every sector of the user community in the ability to manage LANs as they grow faster and become more prolific in business." All major network vendors will shortly offer network diagnostic tools with ease-of-use features for the nontechnical user, Gold predicted.

Protocol analyzers capture and analyze network packets to pinpoint the source of network bottlenecks, collisions and errors and to determine whether messages sent by a given node comply with a particular network protocol. Comnet '89 an-

nouncements in this category include the following:

- Hewlett-Packard Co. will be announcing the 4974S MAP 3.0 Protocol Analyzer, which reportedly addresses all seven layers of the MAP Open Systems Interconnect protocol stack and



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decodes format bits and bytes into higher level messages for easier understanding. It will be available on an HP Vectra or on a card to be installed on an IBM Personal Computer AT or compatible.

HP will also announce plans for an Integrated Services Digital Network (ISDN) protocol analyzer that will initially support the ISDN Basic Rate Interface and, eventually, the Primary Rate Interface, an HP spokeswoman said.

HP will also be demonstrating protocol analyzers from its recent acquisition, Eon Systems, Inc. Eon's analyzers enable users to monitor different LAN segments on a system of networks that are interconnected

over bridges or gateways, the HP spokeswoman said.

- The KAT1000 Protocol Analyzer/Emulator from Kamputech, Inc. is also said to diagnose ISDN protocols. The KAT1000 can grab and display network traffic to pinpoint network trouble spots and traffic jams, according to the Edison, N.J., start-up's executive vice-president, Abroo Shah. It

can also emulate a network node or the network itself, sending or receiving protocols to check whether a system is sending packets correctly, Shah said.

The system supports LAPB of the ANSI X.25 specification as well as Q.931, which specifies how to set up routing and communications sessions over an ISDN link. The system is also said to support bisynchronous, Synchronous Data Link Control and High-Level Data Link Control protocols and will support IBM's Systems Network Architecture as well as Signaling System 7 by the second quarter, Shah said. Also in the second quarter, Kamputech plans to introduce a LAN version of the product, which will support

Transmission Control Protocol/Internet Protocol (TCP/IP). Prices range from \$3,800 to \$10,000.

- Network General Corp. in Mountain View, Calif., will be showing a new Secure Sniffer series, a line of network diagnostic models with the ability to send output to a removable hard disk. This function makes it possible to store the disk in a secured facility and destroy it once its contents are obsolete.

The Series 500RD Sniffer has a 40M-byte hard disk on a card based on Plus Hardcard from Plus Development Corp. The PA-500RD includes a Compaq Computer Corp. Portable 386

ment Corp.'s Local-Area Vax-cluster and Local-Area System Transport protocols. The result will be a Sniffer that will support those DEC protocols, different versions of which will be offered by both companies. Until now, the only DEC protocol supported by Sniffer was DEC's Local-Area Transport protocol, said Network General spokeswoman Carol D'Esopo. "We have struggled to reverse-engineer the DEC protocols without a lot of help from DEC," she added.

Micro Technology, a Placentia, Calif., firm, will incorporate Sniffer into its Lanager, an Ethernet-based protocol analyzer that will support DEC's Decnet,

“WE ARE seeing interest in almost every sector of the user community in the ability to manage LANs as they grow faster and become more prolific in business.”

DOUG GOLD
INTERNATIONAL DATA CORP.

with a Sniffer add-on interface module and analysis software. It costs \$29,000.

Last week, Network General announced an agreement with Micro Technology, Inc. to reverse-engineer Digital Equip-

Sun Microsystems, Inc.'s Network File System, TCP/IP and Apple Computer, Inc.'s AppleTalk protocols, the company said. Available this month, Lanager will be priced from \$21,000 to \$25,000.

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ForeseeaBull

Vendors back OSI net management protocol, but users pose questions

BY ELISABETH HORWITT
CW STAFF

BERNARDSVILLE, N.J. — The OSI/Network Management Forum has officially adopted a protocol that allows different network management systems to exchange data, and several member companies have announced plans to support it.

However, at least one user expressed skepticism about vendors providing standardized integration at the functionality level that network managers are looking for.

Last week, Digital Communications Associates, Inc. (DCA) and Northern Telecom, Inc. announced an agreement to integrate their respective network management systems using the forum's specification, which includes CCITT's Common Management Information Services/Protocol (CMIS/P).

AT&T, which filled in some crucial elements of its Unified Network Management Architecture (UNMA) last week [CW, Jan. 30], intends to make its Net-

work Management Protocol (NMP) fully compliant with the forum's specifications by 1990, according to company spokeswoman Ruthlynn Newell.

Such announcements begin to address the needs of companies that install "a T1 network, modems, PBXs, stat muxes and IBM systems, then buy [a different] network management system for all those," said David Langholff, telecommunications planning manager for Mervyn's department stores. "You can imagine their quandary."

Tying together

At Langholff's former job at Pacific Gas & Electric Co., he wrote a specification to integrate 22 stand-alone systems. "I think there are 10 to 12 systems here," he added.

But the ability to send alerts and alarms between systems via CMIS/P addresses only one aspect of users' needs, Langholff indicated. "Right now, each vendor has its own host platform. What I would really like is for only one mini to run all [network

management] applications," including monitoring, configuring and analyzing all networking devices, he said.

While some vendors such as AT&T are beginning to promise such capabilities, Langholff said he worries about the lack of industry standards to define how such functions will be delivered.

Langholff said that with any multivendor network management product, he would ask the supplier three sets of questions: "First, is it in conformance with standards committees addressing that very issue, or are you coming out with a standard before CCITT? And once a standard is there, how will I be able to migrate to it? Second, what are the differences between what I can get through Netview and other open architectures and yours? Is your philosophy similar? And third, what's the cost? Can I buy standard, off-the-shelf software that will continue to be supported over time? What happens if I want to switch my AT&T Dataphone II modems for Codex modems?"

While DCA and Northern Telecom announced their intention to support the forum's specifications, such protocols do not yet constitute a full-function system, according to Ian Sugarbroad, director of Network Technology at Northern Telecom. The forum's recently released specification includes the upper application layer of CMIS, CMIP and some of the lower layers contained in Open Systems Interconnect (OSI), he said.

Ready to travel

Northern Telecom and DCA will be migrating their network management systems to the forum specification, but company officials indicated that the two vendors will also be working on management functions for which there are no CCITT standards or forum-approved specifications.

AT&T is in a similar position with its NMP, which specifies how other vendors can interface their network management systems with AT&T's UNMA.

NMP is "OSI-based in that it is a compilation of all standards work that's been done to date in terms of network management," AT&T's Newell said. But AT&T has also announced multivendor management capabilities for which no finalized standard exists.

Novell

FROM PAGE 59

— before deciding whether to give IBM a second look.

The turbo gateway, which Stoneman expects to address the current lack of certain statistics, is slated to be delivered to users late this month or early March. "Novell has really listened to us all," Stoneman said.

Novell also plans to deliver a less memory-intensive version of its terminal emulation software, according to Robin Melrose, a senior systems programmer at Wells Fargo Bank in San Francisco, which helps support about 32 3Com Corp. Ethernet LANs with 1,000 nodes: "We've had good luck with Novell's gateways." But the current version takes up 175K bytes. "They need to get it down to about 110K," Melrose said.

Melrose's wish for network management facilities will be answered in Phase III, which is slated to ship in June. "We'll have full IBM Netview interaction," Miller said. This is not a matter of writing to Netview/PC; Novell will use its own LU6.2 PU2.1 code, which Miller said will enable its networks to become full members of the Netview system.

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EDI

FROM PAGE 59

speak Esperanto," he said, drawing an analogy to the century-old attempt to encourage use of an international language.

It has been hard enough for various industry groups to migrate to X.12 from their own EDI protocols, which were designed specifically for their particular type of business and often preceded the ANSI standard, Wheatman said.

However, most industries have accepted the need for X.12 to provide links with other types of business — between manufacturers and shipping companies, for example. Each industry also retains its own EDI subset of industry-specific formats, Wheatman said.

Command performance

But now, such companies are under siege to perform yet another migration to an international EDI standard, and they may be reluctant to do so, Wheatman said. Companies with foreign trading partners may use X.12 domestically and EDIFACT with their overseas partners, or they may rely on third-party services to translate between the two protocols, he added.

EDIFACT was formally endorsed by the U.S. Customs Service, both for the agency's own internal use and in the interests of foreign trade, Wheatman said.

Unfortunately, the agency's endorsement angered ANSI, which feels that the Customs Service should endorse the existing X.12 rather than the unfinished EDIFACT, he added.

Currently, EDIFACT "only has a few transactions approved and ready for use," Wheatman said.

The EDIFACT movement is also encountering resistance in Europe. The Tradacoms standard is said to be solidly entrenched among the UK's EDI users, who make up 70% of the total European EDI installations, according to The Yankee Group, a Boston-based research firm.

A catalyst for change in the UK may, however, be the European Community's (EC) plan to abolish economic borders in Europe in 1992.

Currently, UK EDI users deal primarily with firms within UK boundaries, but the EC plan is focusing their attention on international trade, both across Europe and beyond.

The EC commission said it believes the creation of a single European market could be worth \$250 billion a year, boosting Eu-

rope's gross domestic product by 5%. European organizations are therefore beginning to view EDI as an important tool to help them become more effective players.

Noncommittal overseas

But while they accept EDI as a way forward, many are unwilling to take standards responsibility upon themselves. The majority use third-party network suppliers for transmission of EDI messages, and many think the problem of standards is one for the suppliers to solve.

One such vendor may be IBM, which offers EDI services in the U.S., UK, France, Denmark and Italy. IBM's European EDI services support both the EDIFACT and Tradacoms standards.

Keith Blacker, systems manufacturing manager at UK electronics firm Lucas Industries PLC, says users must take control of the standards debate because of the commercial implications of using EDI. Lucas is using EDIFACT in a limited way while it waits for the standard to become more widely accepted, Blacker said.

IDG News Service staffers Jane Lawrence and Kevan Pearson contributed to this report.

Internet committee to reveal security standard for E-mail

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Internet Activities Board, which runs one of the largest electronic mail networks in the world, will shortly unveil a security standard designed to enhance the privacy of Internet E-mail messages.

In essence, Internet users will be able to encrypt E-mail messages and verify the identity of the sender and receiver.

Developed by the board's Privacy Task Force, the security standard combines the Data Encryption Standard for encrypting the message; an authentication system from RSA Data Security, Inc. in Redwood City, Calif.; and the CCITT X.509 format for authentication and security of E-mail messages.

The proposed security standard includes an endorsement of RSA's Public Key Cryptosystem, said Stephen T. Kent, task force chairman and chief scientist at BBN Communications Corp. in Cambridge, Mass. RSA's technology will be used

for key management and authentication of the public keys used to unlock the encrypted E-mail.

RSA President Jim Bidzos said the key authentication service will be available to the Internet community in the second quarter of 1989. Internet users will be able to use and test the standard within the next six to nine months, he said. Other organizations using Transmission Control Protocol/Internet Protocol (TCP/IP) could also adopt the Internet security standard, Kent added.

Internet is a group of interconnected TCP/IP data networks serving some 500,000 users, including Arpanet and the National Science Foundation's NSFnet.

The network received some notoriety last November when it was invaded by a hacker's computer virus [CW, Nov. 7]. However, Kent said the forthcoming encryption standard is not related to that episode, which exposed flaws in the Unix operating system and the password controls for host systems connected to Internet.

Fig. 3

Fig. 4

Fig. 2

Fig. 1

To understand the advantages of compatibility, simply consider the consequences of incompatibility. "Somebody get me some aspirin." Now you know why we're such fanatics about compatibility.

CompatiBull

EDI council launches users group

BY PATRICIA KEEFE
CW STAFF

ALEXANDRIA, Va. — TDCC: The Electronic Data Interchange Association (EDIA) has launched the EDI Council of the USA, or EDICUSA, as an open forum for EDI users to share information and actively address mutual concerns.

EDICUSA is open only to users, including people from the user side of a vendor organization. A two-tiered dues structure has been instituted: EDIA dues will automatically include membership in EDICUSA. A separate fee will be implemented for non-EDIA members.

TDCC:EDIA serves as the secretariat of the users group, providing administrative support and a resource base for EDICUSA members. Otherwise, the users group will independently pursue the following objectives:

- Promote EDI within the busi-

ness environment.

- Provide education and sources for EDI training.
- Encourage ongoing dialogue between users and vendors.
- Create synergy between and among the various standard-setting groups within the user community.
- Monitor the impact of relevant legislation on users, as well as future developments within the international EDI community.

The group met in December and elected the following to its board of directors: Vincent J. Calandra, Union Carbide Corp. (chairman); Ed Null, Giant Food Stores, Inc. (vice-chairman, technical); Lydle P. Simpson, Federal Express Corp. (vice-chairman, business); and Jerome L. Dreyer, EDIA (president and chief executive officer).

Other members include Robert T. Crowley, Trans Freight Lines; Rachel Foerster, Baxter Healthcare Corp.; Kent Jamison, Yellow Freight System, Inc.; Gene A. Nelson, Dry Storage Corp.; and Marvin K. Segar, Southern Pacific Transportation Co.

EDICUSA's board meets again in March; the next general users group meeting is slated for April 11 in New Orleans in tandem with the ANSI ASC X.12 EDI Conference and Exposition.

NCD fires early-warning shot

Takes on low-end scientific workstation with its network graphics terminal

BY PATRICIA KEEFE
CW STAFF

MOUNTAIN VIEW, Calif. — Network Computing Devices, Inc. (NCD) fired an early-warning shot at the low-end of the scientific workstation market with last week's release of a network display terminal.

Industry observers said they expect entrants in the network display arena to begin peppering workstation competitors during the next six months to a year.

NCD's desktop box is said to feature high-resolution graphics, an X Window System-based interface and communications capability for \$2,500 — about half the entry-level price of a typical technical workstation.

In the middle

Judith Estrin, NCD's executive vice-president, said the NCD16 is positioned between an ASCII terminal and a full-blown Unix or Digital Equipment Corp. VMS-based workstation.

The differentiating factor is an orientation toward display and communications functions at

the expense of applications processing, which is handled by the host or server such as a DEC VAX or Sun Microsystems, Inc. workstation.

Functioning as a graphics front end, the NCD16 lets users protect and leverage installed bases of minicomputers without having to make more costly investments in workstations and personal computers, according to Estrin.

Developed at MIT, X Window Version 11 is a de facto windowing standard for networks. The technology is in the public domain and is supported by 35 major computer vendors.

Price-sensitive arena

Analysts expect what has been dubbed the X-terminal market to become an extremely price-sensitive area; early comments from users indicate that NCD may have to lower its \$2,500 sticker price.

In addition to support for the X Server, key features of the NCD16 include extremely sharp resolution — 1,024 by 1,024 pixels and 105 dot/in. — and

concurrent access to multiple network resources residing in different environments, displayed in separate windows.

The enabling integrators are Unix, Ethernet and Transmission Control Protocol/Internet Protocol (TCP/IP) support.

The NCD16 display station features a built-in X Window server, a graphics coprocessor, a bit-mapped graphical interface, 1M to 4.5M bytes of dynamic random-access memory, multiple sessions to various hosts that reportedly can be viewed through different windows simultaneously and a large monitor — in this case, a full 16-in. diagonal monochrome screen.

The Motorola, Inc. 68000-based NCD product also features a flicker-free screen and modular communications interfaces that are said to accommodate different network technologies such as thick and thin Ethernet and TCP/IP. In addition, it possesses the ability to offload communications and display processing from any host to the display station. Client applications run on the host.

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NEW PRODUCTS

Local-area networking hardware

Viteq Corp.'s Benchmark 386/LAN and 15A/LAN uninterruptible power supply network interface capabilities are now available for file servers in both Novell, Inc.'s SFT Level II and Banyan Systems Inc.'s Virtual Networking Software environments.

Viteq's Benchmark UPS reportedly interfaces with the file server to notify the operating system when utility power has been interrupted. The operating system subsequently initiates an automatic,

timed shutdown routine and informs remote stations of the impending shutdown. The Benchmark 386/LAN and 15A/LAN UPS are priced at \$1,945 and \$3,445, respectively. Interface cabling is included.

Viteq, 10000 Aerospace Road, Lanham, Md. 20706. 301-731-0400.

Digital Storage Systems, Inc. has expanded its line of local-area network backup subsystems for IBM Personal Computers and compatibles.

The 10/ARC (Automated Recovery and Control) subsystem can reportedly write data to streaming tape without operator intervention. The product consists

of a software module that continually resides in the processor, a buffered controller add-in board, and tape catalog management software that resides on a hard disk.

Pricing ranges from \$595 to \$2,395, depending on configuration.

Digital Storage Systems, 1234 Sherman Drive, Longmont, Colo. 80501. 800-225-3953.

Network General Corp. has announced a protocol analyzer designed for next-generation token-ring local-area networks, according to the company.

The Sniffer was developed for 16-megabit IEEE 802.5 token-ring LANs and is reportedly built around Texas Instruments Inc.'s token-ring chip set. The

product is targeted as a diagnostic tool for developers and will be available in multiple configurations across the vendor's three product lines.

Pricing ranges from \$12,500 for module versions and \$15,750 to \$24,000 for laptop and portable configurations.

Network General, 1945A Charleston Road, Mountain View, Calif. 94043. 415-965-1800.

Local-area networking software

Micom Communications Corp. has announced the Pcxchange Networking Software package, designed to optimize personal computer usage on the company's Instanet networking systems.

The product reportedly allows IBM Personal Computer and compatible users connected to the Instanet systems to transfer files and shared printers as well as communicate with host computers on the network. The menu-driven software is priced at \$75 per copy and is scheduled for delivery this month.

Quantity discounts and site licenses are available.

Micom, 4100 Los Angeles Ave., Simi Valley, Calif. 93063. 805-583-8600.

Baler Software Corp. has added networking capabilities to Version 4.0 of the Baler Spreadsheet Compiler.

The latest release will reportedly allow developers to install applications on a local-area network as well as lock out relevant data files and protect them from overwriting by other users. The product works with any spreadsheet program that writes WKS or WK1 files and is priced at \$495.

Baler, 2300 N. Barrington Road, Hoffman Estates, Ill. 60195. 800-327-6108.

Links

Metaphor Computer Systems, Inc. has announced two gateway products designed to permit Metaphor Data Interpretation System users to directly access databases on Teradata Corp. DBC/1012 computers and Oracle Corp. databases on Digital Equipment Corp. VAX machines.

According to the vendor, the Teradata Gateway is said to be a combination hardware and software product that includes a gateway processor, Metaphor Communications Software and Host Communications Software. It is priced from \$65,000 to \$205,000, depending on the number of users.

The Oracle VAX/VMS Gateway includes the same hardware and software components, which are tailored for the VAX/VMS operating environment. The DEC VAX computer is connected directly to the Metaphor network via a standard Ethernet controller board and drop cable. Pricing ranges from \$35,000 to \$75,000.

Metaphor Computer, 1965 Charleston Road, Mountain View, Calif. 94043. 415-961-3600.

Plexcom, Inc. has announced the availability of the 8011 Ethernet fiber-optic hub.

According to the vendor, the 8011 is a four-port modular card that connects remote Ethernet segments and forms a central fiber-optic hub for connection of Ethernet segments or Plexnet concentrators. It is priced at \$1,695.

Plexcom, 65 Moreland Road, Simi Valley, Calif. 93065. 805-522-3333.

UPWARD COMPATIBILITY



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Strategy did. SynOptics Communications planned its LattisNet architecture to meet current customer needs while providing an upward migration path to the emerging 10BASE-T standard.

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PRODUCT SPOTLIGHT

MICRO-TO-HOST LINKS

Cooperative processing: One step beyond

BY DAVID GABEL

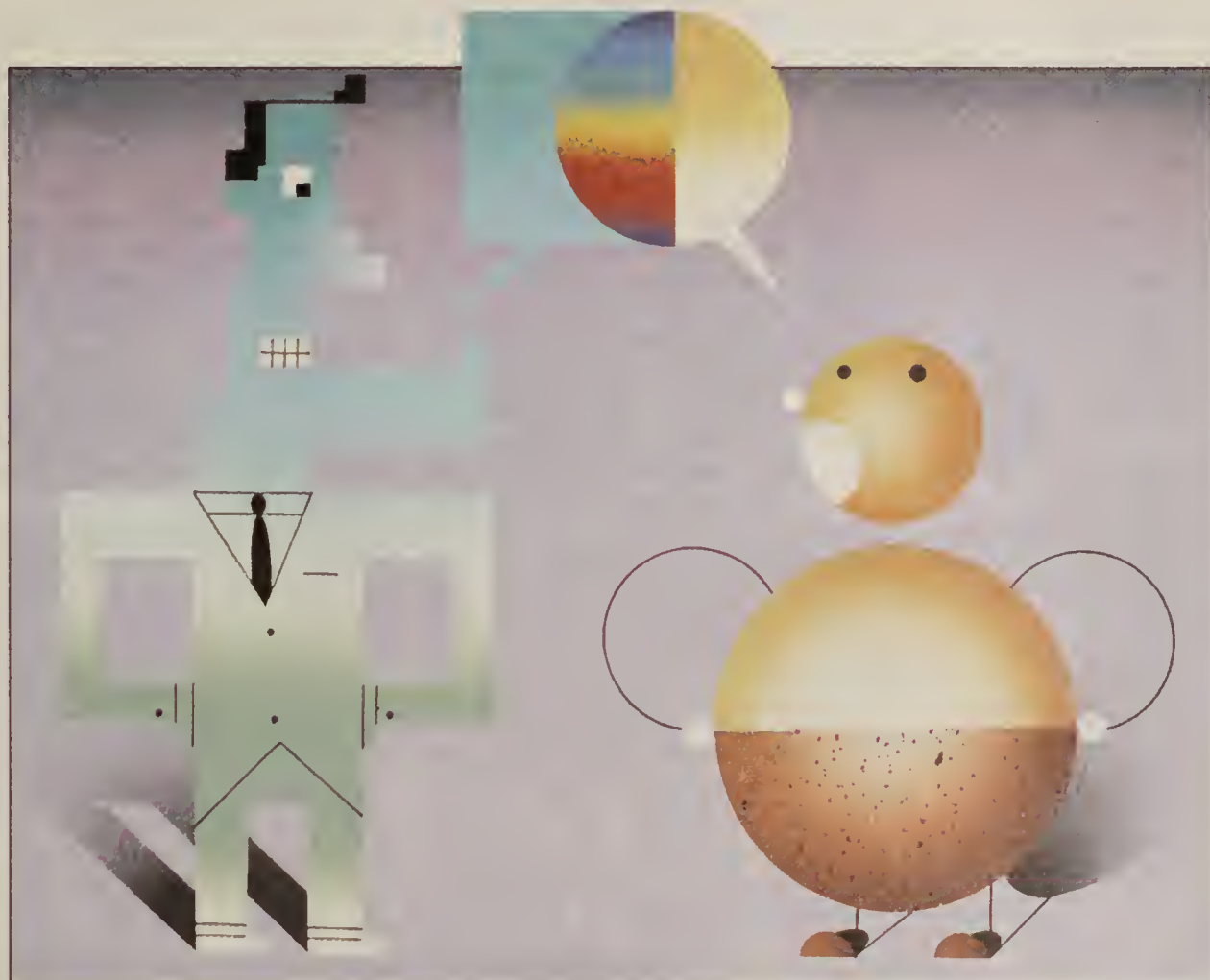
The micro-to-host link market is not ailing, but it is already beginning to contemplate an afterlife in the form of cooperative processing. Although the heralds have already begun to announce the imminent arrival of products that offer this capability, cooperative processing is still more a matter of faith than fact, and the conflicting pitches of numerous evangelical marketers are producing considerable confusion.

Right now, figuring out what a cooperative processing product actually does is not easy because many vendors use the term loosely. Some software publishers say their file transfer products provide cooperative processing, while others claim their communications software package's ability to automate the communications process constitutes cooperative processing.

There are also products that allow users to develop script files, which automate the connection process. This approach is closer to the functionality of cooperative processing, but it is not the real thing either.

What cooperative processing really is is a method of processing applications that has communications as an integral part of the overall process of completing the application. In cooperative processing, several processors will work on parts of the application that they are best at handling; some will do number crunching, some presentation, some data moving and lookup, some high-speed parallel operations and so forth. Each processor communicates with the others, but at the highest level — the application level.

To understand cooperative processing products, one needs to understand the layered nature of data communications systems. By now, most people are



TERRY ALLEN

familiar with the seven-layer Open Systems Interconnect (OSI) reference model developed by the International Standards Organization (ISO). At the lower layers of the model are the link definitions that talk about the cable that signals will use, as well as protocols that shape the messages to be communicated. Higher levels handle message routing, establishing end-to-end communications and other tasks that are key for communications.

The highest layers of the ISO model, the Presentation and Application Layers, are not essen-

tial for communications; therefore, they have not, in large part, been exploited until now.

For example, a file transfer application can take a large data file from a mainframe and load it on a microcomputer. The user need never see the data as it transfers; the Presentation Layer is not active. Then the user can load the data into a spreadsheet for manipulation; this application is not part of the communications process.

These two last layers of the communications model are not necessary for communications,

but they are required for cooperative processing to take place.

Communications is not the end result here, but only one aspect of the process. Cooperative processing products, then, are not, strictly speaking, micro-to-host link products; rather, they are either applications built on an underlying link foundation or tools designed to assist in the development of such applications.

Examples of both types of products are beginning to appear on the market, but they are coming slowly and their capabilities vary widely.

Among the most developed products are Cooperative Processing from Global Software, Inc.; Peer Services from Tangram Systems Corp., which also makes Arbitrator, a micro-to-mainframe link; and Enter/3270 from Aspen Research, Inc. Cooperative Processing falls into the application implementation category, while Peer Services and Enter/3270 are considered to be

INSIDE

Virtual distinctions

Discover the differences among the multiple products that wear the badge of virtual disk. Page 73.

A bottom-line connection

Atlantic Steel finds it can extract significant savings by updating its micro-to-host connections. Page 75.

Gabel is a free-lance writer based in Northport, N.Y.

One step beyond

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cooperative processing tools.

The Mead Corp. in Dayton, Ohio, is using the Cooperative Processing product, which includes both mainframe and personal computer application software as a complete system. When Cooperative Processing is running, all application data stays on the mainframe, but the resource-intensive data processing is performed on the user's local PC.

This means the PC can display data and allow for interactive output, thus reducing the demand placed on the mainframe's resources while still providing the PC's ease of use to the end user.

Budget benefits

"We use it for internal budgeting," says Doug King, financial systems coordinator at Mead. "We presently have six divisions using the product. It gives the user the ability to manipulate data that he needs and to get that data from the mainframe."

The budgeting application Mead uses is Global's first cooperative processing product, and it runs in conjunction with the vendor's mainframe budgeting package. The goal was to give the users who really do the budgeting — the field budget officers — access to that package.

Before Mead began to use Cooperative Processing, the divisions had a number of methods for completing their budget projections. "They'd be using Lotus and all sorts of things," King says.

Not only did this diversity mean massive rekeying, but it also meant that field budget managers were working without direct access to historical data on the mainframe system.

Use of Cooperative Processing eliminates both of those problems, while still allowing users the comfort of their famil-

iar tools. Based on user input, King says, Global redesigned Cooperative Processing so that users could pass data to Lotus Development Corp.'s 1-2-3 for presentation.

The budgeting implementation is only a beginning, according to King. The company is interested in extending its use of Cooperative Processing into other areas, and it plans to hook the tools into other mainframe application software offerings.

Aetna Life and Casualty Co. in Hartford, Conn., is using Peer Services in its Personal Financial Security Division.

Peer Services defines an application programming interface (API) that PC-based transaction programs use to

hold conversations with the remote system transaction programs. The API is a collection of subroutines that correspond with verbs defined in IBM's Advanced Program-to-Program Communications (APPC), which allows PC programmers to control the interface to a remote application. Moreover, the programmer can control the messages the PC application sends to the host application using Peer

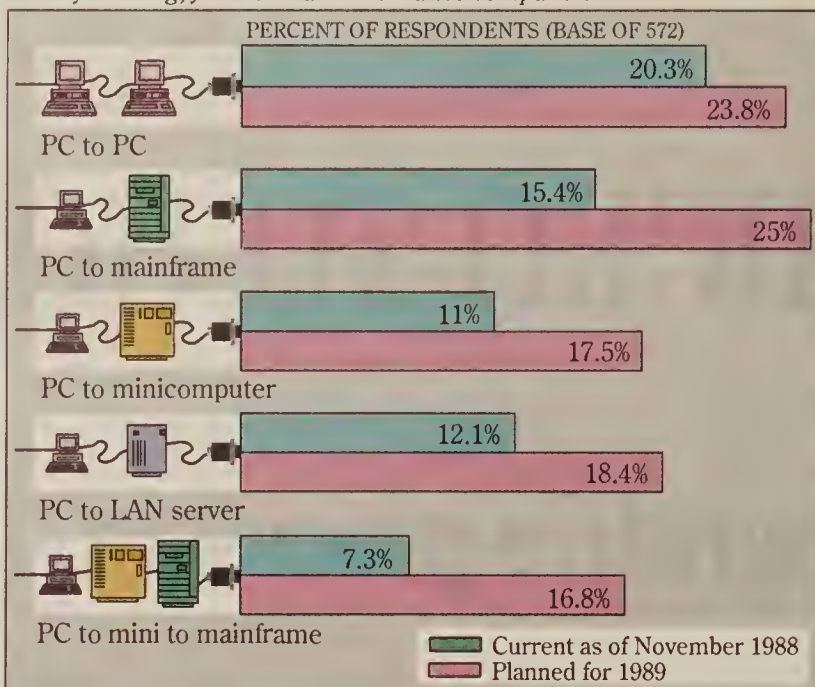
Services.

According to Alan Small, Aetna's senior administrator in PC support, the division is getting ready to field an application that uses Peer Services. "We decided to do this," he says, "because we were just too limited by the parameters of 3270 communications. We were suffering with those limitations, and we needed interactive capability."

One of the applications that will use cooperative processing techniques, Small

Connection directions

PC-to-mainframe connections head the connectivity shopping lists at manufacturing, financial and insurance companies



SOURCE: THE SIERRA GROUP, INC.
CW CHART: DOREEN DAHLE



Mead's King

says, involves sending about five screenfuls of data from a PC (local or remote) to a mainframe computer. When this is done using 3270 master-slave communications, each screen has to go through an edit process at the mainframe, and errors are flashed back to the PC, a time-consuming process.

"With Peer Services," Small explains, "we will be able to handle all this data as one transaction and do the edits locally on the PC. The PC will handle presentation services, too."

A healthy improvement

At Great-West Life Assurance Co., a health-insurance carrier headquartered in Englewood, Colo., Enter/3270 has been used to develop Benlink, a cooperative processing system.

Enter/3270 allows the development of new interactive front ends for old communications-based applications. The interactive front end can perform local data checking on user inputs and provide

screen-handling functions, automatic logon to a mainframe and other services. Enter/3270 consists of a development and a runtime model.

Benlink provides Great-West Life customers with remote dial-up access to the Great-West mainframe computer and allows them to obtain a history of the claims their account has experienced.

"We built an application where we can script them into TSO and get into a TSO flat file, which the application then reformats into a presentation screen," explains Karl Berry, assistant manager of Benlink systems support. "We're getting pretty good feedback from the users who have this software."

The system is still in the testing stage, but Berry says the users involved "quickly became dependent on it."

According to Alan Parnass, president of Aspen, the product has four target areas: applications that enhance the user interface; applications that need local data validation; applications that provide easy access to mainframe data; and applications that are extended onto the PC, as in loading data from a mainframe into existing PC programs.

Many of these applications are clearly not cooperative processing, but others are, or at least are a beginning of the functionality of cooperative processing.

Right now, cooperative processing products are, in many cases, interim steps to full implementation of the concept.

In the IBM sphere, in which the architecture of communications has traditionally been based on hierarchical, master-slave principles, a reorientation has begun to take place. IBM has provided the groundwork for cooperative processing in its LU6.2 definition for peer-to-peer communications and in its Systems Application Architecture (SAA) definitions for APPC.

But moving from this basis to fully structured cooperative processing is not easy, and some of the current generation of products, including Enter/3270, do not take advantage of the capabilities of SAA.

Bernd Harzog, senior product manager at Digital Communications Associates, Inc. (DCA) in Alpharetta, Ga., points out one reason for the lag.

"APPC/PC takes 320K bytes of memory before you can write an application," Harzog explains. Because a PC running DOS is limited to 640K bytes of memory, it is apparent that cooperative processing using IBM's APPC/PC will need OS/2 to

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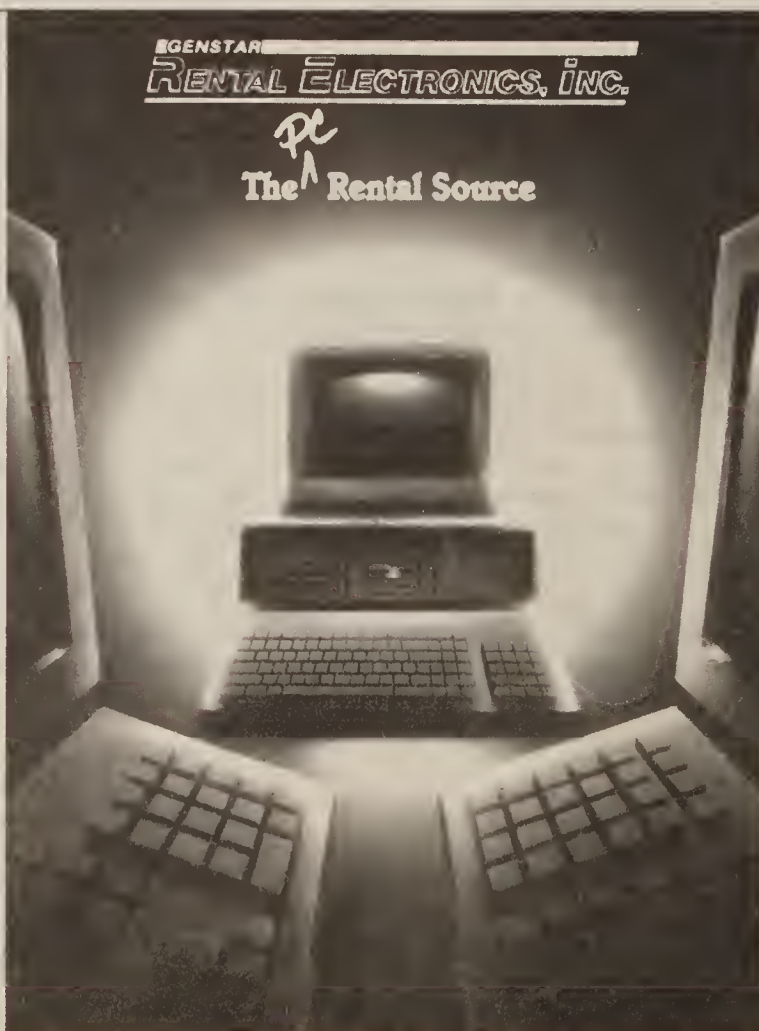
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Link gives Utah the long arm needed to control sale of spirits

BY DANA STERN

The days of Prohibition may be long gone, but that has not stopped Utah's Department of Alcoholic Beverage Control from keeping a handle on state-wide liquor sales.

In Utah, one of 19 states that controls the sale of alcoholic beverages, the department buys the liquor wholesale and then sells it at fixed prices to 36 state-operated stores and 96 state-contracted package outlets.

This arrangement has been in place for more than 50 years, but, until the recent installation of a micro-to-host network, the department, based in Salt Lake City, was limited in its ability to communicate with the outlets that are peppered around the state.

The tracking of store sales and inventory data and the communication of instructions on

price changes and product coding was difficult when the department had to rely on an NCR Corp. point-of-sale system, says Programmer/Analyst David Lines.

That system, which consisted of Model 2140 cash registers and NCR's Adcom communications software for transfer of files to an NCR 8200 minicomputer at department headquarters, was inefficient and time-consuming, Lines adds.

Once a file transfer was completed, the department's data processing staff had to go through a fairly lengthy process to convert the information and transmit it to the Hewlett-Packard Co. HP 3000 host computer. The process was particularly complicated because of odd file structures, Lines says.

In addition, the NCR system was only as reliable as the memories of store personnel.

"Someone always had to be here to push the buttons to start that transfer," Lines says. "We had to rely on the store managers to [remember to] run a job" before they left for the day.

"If they didn't, we couldn't communicate with them," he adds.

Now, Century Software, Inc.'s Term communications software package performs terminal emulation and file transfer between IBM-com-

patible personal computers recently installed in 35 of the stores and an HP RS16 personal computer in the department's data processing section.

Lines says he chose Term because it is compatible with the DP division's HP 3000 and can

transmit information directly to the 3000. In addition, Term's script files also work under Unix, an option that is important because Lines says his division is currently considering switching to Unix.

One of the major benefits of the new configuration is that it allows the Beverage Control Department to collect information from stores during off-hours with the help of Automate, an automatic scheduler, initiator

information, which ranges from band codes to prices to inventory, is then uploaded to the host HP 3000 using Reflection, a communications software program from Walker, Richer and Quinn, Inc. Reflection performs terminal emulation and file transfer.

Automatic start-up

With Automate, Lines says he can incorporate a job into a schedule that is initiated automatically at a predetermined time each day. Any job that is normally performed at the DOS prompt can be scheduled to execute on a daily or monthly basis.

"We are guaranteed that the machine is shut down and waiting for communications because Automate controls the machine," Lines says. "If [a transmission] is messed up, it's because of Automate. We can't blame the [store] managers."

With the new program, Lines says he now communicates with the stores four times a week. Because of the unreliability of the old system, he was previously receiving transmissions once a week at the most and sometimes only once a month. Communicating with the stores automatically at night also frees up the stores' and the DP department's PCs during the day. •



Utah's Lines

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One step beyond

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become really useful.

That, in fact, is a primary reason for the definitions of the SAA. "IBM's SAA is trying to get a series of application-level tools to provide cooperative processing using the level of skills available in the commercial marketplace," says Tom Nolle, a consultant at CIMI Corp. in Haddonfield, N.J. "Since IBM has so many different operating systems," he explains, "it is trying to unify its offerings [to provide cooperative processing] with SAA."

For example, Management Science America, Inc. (MSA) in Atlanta has introduced Brightview, a program that runs on IBM Personal Computers and compatibles that interface with a mainframe; the product handles some or all of an application's editing and formatting chores.

"Using Brightview," says Brian Cohen, vice-president of technology and research for MSA, "we replace the terminal in an application with an intelligent workstation and have it do some services like field-level editing, windows, icons and so forth. We use the intelligent workstation to interpret data."

But Cohen concedes that this is only a step in the direction of cooperative processing. Brightview lets the PC run the user interface and handles communications for the user, but it does not use peer-to-peer communications or APPC. "We will be trying to rebuild our entire product line from the ground up over the next couple of years," he says, "to reorient it toward cooperative processing."

However, Brightview is only now going into beta testing, so even this interim stage will not be available for a while.

DCA is planning to field a cooperative processing tool this spring; Harzog says DCA's Select CS product gives APPC connectivity to a LAN Manager local-area network. "It makes APPC available, and APPC is the programming interface to which you would write a cooperative processing application."

When Select CS is available, it will get around the DOS memory problems in an interesting way. If all the software to make APPC possible were loaded onto every PC on the network, then every PC would have much of its memory tied up with communications tools. Select CS loads LU6.2 software and physical unit (PU) 2.1 software into an OS/2 host on the network, which can address more memory than a DOS machine can. "The DOS client only holds APPC and the application," Herzog says. "You can build an APPC interface for less than 50K bytes."

Different worlds

Cooperative processing in the non-IBM world presents a different set of issues. "What IBM is doing is giving you a very IBM-specific answer made necessary by the fact of incompatible architectures," says Donald Bellomy, an analyst at International Data Corp., the Framingham, Mass.-based market research firm. In the non-IBM world, "there is a different set of questions to answer because of the different architectures."

Some answers are emerging for that set of questions, but, for the most part, they are as partial and tentative as their counterparts on the IBM side.

In the non-IBM world, it is the machine vendors, rather than third-party software vendors, bringing out the cooperative

processing software that will allow such applications to run on their machines.

Unix provides one way that cooperative processing can be accomplished — through its Named Pipes facility. For example, the Unix operating system has had, from the beginning, intertask communications that allow data from one task to be shipped to another. If the tasks reside on different processors connected through a LAN, for example, cooperative processing is possible.

"Named Pipes can be extended through communications links," Nolle says, "and AT&T as well as Microsoft have committed to extending Named Pipes across the network."

Because Unix is available and because

Continued on page 73

Strongest links

Crosstalk is ahead of the pack and is solidifying its lead in the micro-to-mainframe link software market, having gained nearly 6% in share since the end of 1987

	Percent market share	
	Q4 1987	Q3 1988
Crosstalk Communications' Crosstalk	20.2%	25.8%
Pansophic Systems' Panlink	17.3%	16.5%
IBM's File Transfer	13.1%	12.1%
McCormack & Dodge's PC Link	9.7%	8.9%
Columbia University's Kermit	6.9%	5.8%
On-Line Software International's Fremlink	5.3%	4.4%
Other	27.5%	26.5%

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Virtual disk: Let use decide

BY MICHAEL HURWICZ

Micro-to-mainframe virtual disk software works with standard mainframe connectivity hardware for personal computers; it allows PCs to use portions of mainframe direct-access storage devices (DASD) to store files. Typically, a file on the mainframe appears to the PC like a local microcomputer disk or a group of disks. Separate data elements within that file look like files to the PC.

Hurwicz is president of the MTI Group, a data communications consulting firm in Nashville.

There are not many products on the market that offer a virtual disk capability as their main function. However, a wide variety of products, from database managers to communications programs, include a virtual disk feature. The criteria for evaluating a virtual disk's suitability depend chiefly on its intended use.

Companies generally implement virtual disks on a mainframe for one of three reasons. First, virtual disks facilitate data sharing. Second, they provide administrative advantages in areas such as data se-

curity and backup. Finally, a virtual disk may be used as the basis for multiuser file service.

However, some criteria, such as the user interface, apply equally to all uses. Products may have menu-based interfaces, command interfaces, script languages and programming interfaces.

Another criterion that applies to all uses of a virtual disk is the type of communications hardware that is supported. Users who already have mainframe links need to make sure that their virtual disk vendor supports those links. Most vendors support popular micro-to-mainframe standards such as Digital Communications Associates, Inc.'s Irma, but support for less dominant brands is not assured.

A third consideration is the load the

virtual disk software puts on the mainframe. Generally, a package that runs under VTAM will put less strain on the mainframe than one that runs under TSO or CICS.

File transfer and terminal emulation capabilities leave a lot to be desired for micro-to-mainframe data sharing, but virtual disks can overcome many of these limitations.

Terminal emulation allows PCs to access data and applications on mainframes, and file transfer can be used to pass data between mainframes and PCs. However, with terminal emulation, files on the mainframe can only be accessed by applications running on that mainframe.

Thus, PC users have to learn how to
Continued on page 74

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One step beyond

FROM PREVIOUS PAGE

the Unix minicomputer vendors often offer more internal compatibility across their product lines, the task in the non-IBM world is quite a bit simpler.

In the case of Digital Equipment Corp., the answer is Decnet/OSI, which Bob Bradley, technical staff member for distributed system strategic planning, says is really Phase III of the company's strategy for networking. Decnet is the term DEC uses for its networking products. Decnet/OSI supports both DEC-specific protocols and a set of protocols defined by the ISO. Under Decnet/OSI, Bradley says, DEC "can provide cooperative processing using distributed processing logic and distributed data across the network."

Decnet/OSI is not currently a full set of product implementations, but some of its components are already here, such as Decnet System Services (DSS). According to Bradley, a user in Massachusetts can use DSS to write a program to run on his local machine that will read a file on a machine located in England.

Decnet/OSI is one part of the firm's Digital Networking Architecture strategy, and it happens to be the portion that supports cooperative processing. It provides the services that programmers can use to develop cooperative processing applications and the services that future cooperative processing products will use as their underlying foundation.

Data General Corp. refers to cooperative processing as client/server computing. In client/server relationships, the two entities are equals from the communications sense, but each one has its own job to do.

"We provide software that responds to the client/server approach," says Chris Stone, manager of office systems and software for Data General. "We use a PC as a client and an MV [minicomputer] as the server. We run components of the application where they are best suited. For example, we will run graphical applications on the workstation and number crunching on the server and return the result to the client."

These applications do not sound like cooperative processing, and indeed, it would be stretching the point to say they are. Stone explains, "I don't want to sound like I'm saying, 'Hey, we're here.' This isn't simple. It will be three to five years before half the market is developing products in this area, but it will do it. In the next year to 18 months, there will be more products." •

Virtual disk

FROM PREVIOUS PAGE

use mainframe programs to get at mainframe data. Using file transfer to copy the files to PC disks allows mainframe data to be used with PC applications. But file transfer is time-consuming and requires disk storage on the PC. Furthermore, once the files are on the PC, they are inaccessible to mainframe users.

A micro-to-mainframe virtual disk can eliminate these difficulties. It allows PC applications to access data on the mainframe without copying the files to the PC and without making the files inaccessible to mainframe users.

But mainframe applications typically

cannot directly access the data on virtual disks. Instead, the file has to be copied to a different part of the mainframe's disk and its format changed in the process.

Weighing ease, transparency

When using virtual disks for data sharing, transparency and convenience are the primary considerations. All of the major vendors provide virtual disks that do most of the things real PC disks do. For instance, almost all the relevant DOS commands work for the virtual disk just as they do for a local disk. There are a few commands, such as FORMAT, that cannot be applied to the virtual disk but, for the most part, those commands are unnecessary.

All the major virtual disk products also

provide the necessary translations when copying a file between the virtual disk and another part of the mainframe disk or between the virtual disk and the PC. However, products may support different PC application formats such as the WKS format for Lotus Development Corp.'s 1-2-3, Ashton-Tate Corp.'s Dbase DBF format or the Data Interchange Format.

A good PC programming interface can add to the convenience of using a virtual disk for those firms that have in-house PC programmers able to take advantage of it. A PC programmer should be able to invoke a mainframe program to manipulate information, move data from place to place on the mainframe disk and also return information to the micro program.

It is also convenient to be able to ma-

nipulate data from the mainframe side. Most virtual disk products allow a user at an IBM 3278 terminal to copy information from a virtual disk, manipulate it and write it back to the virtual disk. They usually also provide application programming interfaces that allow programmers to integrate virtual disk access into mainframe database programs. Some allow any file on the virtual disk to be accessed from the PC. Therefore, no copying is required.

Mainframe shops have established procedures for monitoring access and archiving data. By storing data on mainframes, PCs can take advantage of the mainframe shop's prowess in these areas. However, in order to do this effectively, the virtual disk product must integrate smoothly with the mainframe administrative systems.

For example, mainframe security should be applicable to the virtual disk. Users should be able to protect virtual disks using their security system of choice, such as IBM's ACF2 and RACF and Computer Associates International, Inc.'s CA-Top Secret. Most virtual disk systems allow for this, although the facility that makes this flexibility possible may be listed as a separate item.

Most virtual disk systems also provide some kind of facility for monitoring users on the mainframe. There are wide variations in what can be monitored from the host side, though. For example, a host administrator may be able to find out which DASD a user is on but not which virtual disk is being used. That information may only be obtainable from a PC.

With other products, the host administrator may be able to tell which "library" of disks each user is accessing. At least one product, Arbiter from Tangram Systems Corp., shows each user and the virtual disk that user is accessing. Arbiter also reports on the type of communications link and on the PC's configuration, such as what version of DOS it is running and what type of mainframe board it has.

Usage accounting for chargeback and capacity planning should integrate with existing systems. Generally, this means that the virtual disk software should create system management facility records, which can then be processed by the usage accounting system. All the major vendors can provide this capability.

File service

A virtual disk product can provide a basis for a virtual local-area network server. For instance, Tempus-Share from Micro Tempus, Inc. implements a Microsoft Corp. MS-Net server on an IBM mainframe. Similarly, PSAM/LAN from Phaser Systems, Inc. emulates a Novell, Inc. Netware server.

The same questions that arise with virtual disks arise with file servers. How transparently does the server integrate with the LAN? Do all LAN functions work with the file server? From the mainframe side, does the server integrate smoothly with existing mainframe facilities?

One advantage of file service over the simple disk is that, while most virtual disks are limited by DOS to a 32M-byte maximum disk size, file servers can go much higher. For instance, Tempus-Link, which is just a virtual disk, can only support a 30M-byte disk. Tempus-Share, which provides file service, can support disks up to 40G bytes. However, with DOS 4.0, multigigabyte storage will be available through DOS, even without file server capabilities. •



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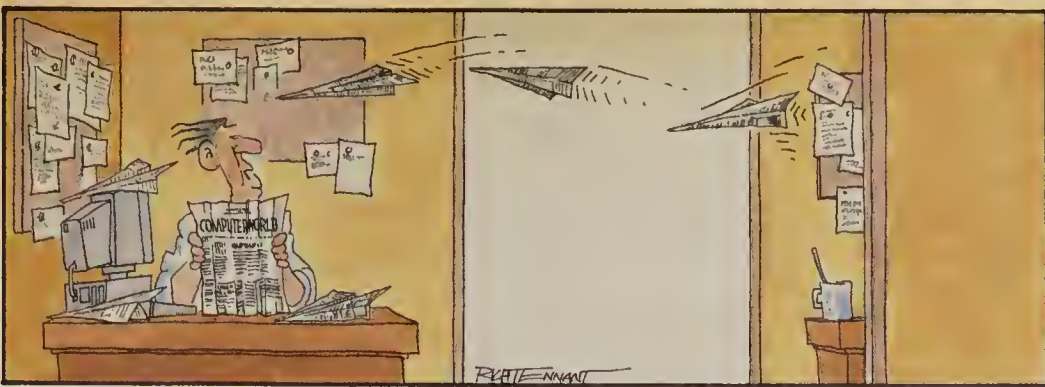
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- D. Communications Systems
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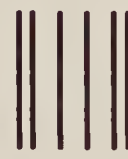


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Steel firm forges data link

BY LEONARD HINDUS

Pressure turned Atlantic Steel Co., a steel reprocessor in Atlanta, into an innovator in the use of micro-to-mainframe technology. "We were driven to innovation by the crippling market pressure in the steel industry," Jerry Ward, the director of MIS, explains. "We had to find the most cost-effective way to give our end users the computing power they needed while maintaining the integrity of our data."

Atlantic Steel uses Dyl-Vlink, a micro-to-mainframe link product from the Dylacor Division of Sterling Software in Chatsworth, Calif., to allow its IBM 4341 mainframe to function as a file server. The mainframe is used to gather and organize data for statistical process control, traffic control, freight rate equalization and other analytical chores, but much of the number crunching is performed by the linked microcomputers.

Also, the company has realized significant cost savings by using a Compaq Computer Corp. multiuser system based on an

of multiple microcomputer networks," he explains. "We have one network, which is transparent to the users and meets all our needs. The Dyl-Vlink network is so easy to use that the microcomputer users may not be aware that they are using virtual diskettes on the mainframe."

This method, he says, has united a company that is spread out across 30 acres in the heart of Atlanta as well as a plant that is 70 miles away. "Our end users get the best of both worlds: the inde-

pendence and responsiveness of a micro environment and the power and cohesiveness of a mainframe," Monroe claims.

There are also advantages for the MIS department, chiefly peace of mind about the security of corporate data.

"Not only can we physically protect the data during our nightly backup," Ward says, "but we can also control access on a user-by-user basis. Marketing, personnel and production are on different virtual diskettes with different sets of security. In addition, no micro users have direct access to our mainframe databases."

The success of the program to move computing off the mainframe created a tremendous demand for micros throughout Atlantic Steel and led directly to its second creative leap in end-user comput-

ing. Rather than equip all users with stand-alone micros, the company chose to experiment with 386-based micros running PC-MOS/386, a multiuser, multitasking operating system from Software Link, Inc. in Norcross, Ga.

Double hit

"Our micro-to-mainframe network was a big hit," Ward says. "But that also meant we were getting hit for \$5,000 to \$6,000 every time we added a user. We had to be able to afford to add more users. That's how we discovered that we could use a 386 machine like a minicomputer. By that I mean that one 386 system can support a number of users on 'dumb' terminals."

The initial investment required for
Continued on page 86

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The initial impetus for the micro-to-mainframe connection was the need to find an alternative to expensive and inflexible mainframe statistical process control software.

Intel Corp. 80386 processor to support a number of terminals. Each terminal has access to the IBM mainframe through the 386, which is connected via Dyl-Vlink.

Ward says that, taken in total, he considers the eight Dyl-Vlink connections to be a true data network with the mainframe as the hub. Any number of microcomputers can access the same virtual diskette simultaneously, he explains. Information is transferred from the mainframe to virtual diskettes and back, using the DYL-280 data management and extraction tool. Simultaneous updates are locked out to maintain data integrity, he says, and the virtual diskette acts like any hard disk on a micro except that users can also share documents on the network.

The initial impetus for the micro-to-mainframe connection was finding an alternative to costly, inflexible mainframe statistical process control software.

However, other advantages soon became apparent, and the scheme was extended. "Microcomputers are especially useful for ad hoc requests and analyses, which do not require the time and expertise of our professional development staff," Ward says. "The end user can get into the data and do some things on his own without having to wait for me."

Another plus, says Charles Monroe, the end-user computing coordinator, is that, because the data is stored on the mainframe in the form of virtual diskettes that look like additional floppy drives, microcomputer users do not have to learn mainframe jargon or job control language.

Monroe also stresses the simplicity of connecting all the end users in this way. "We have avoided the cost and confusion

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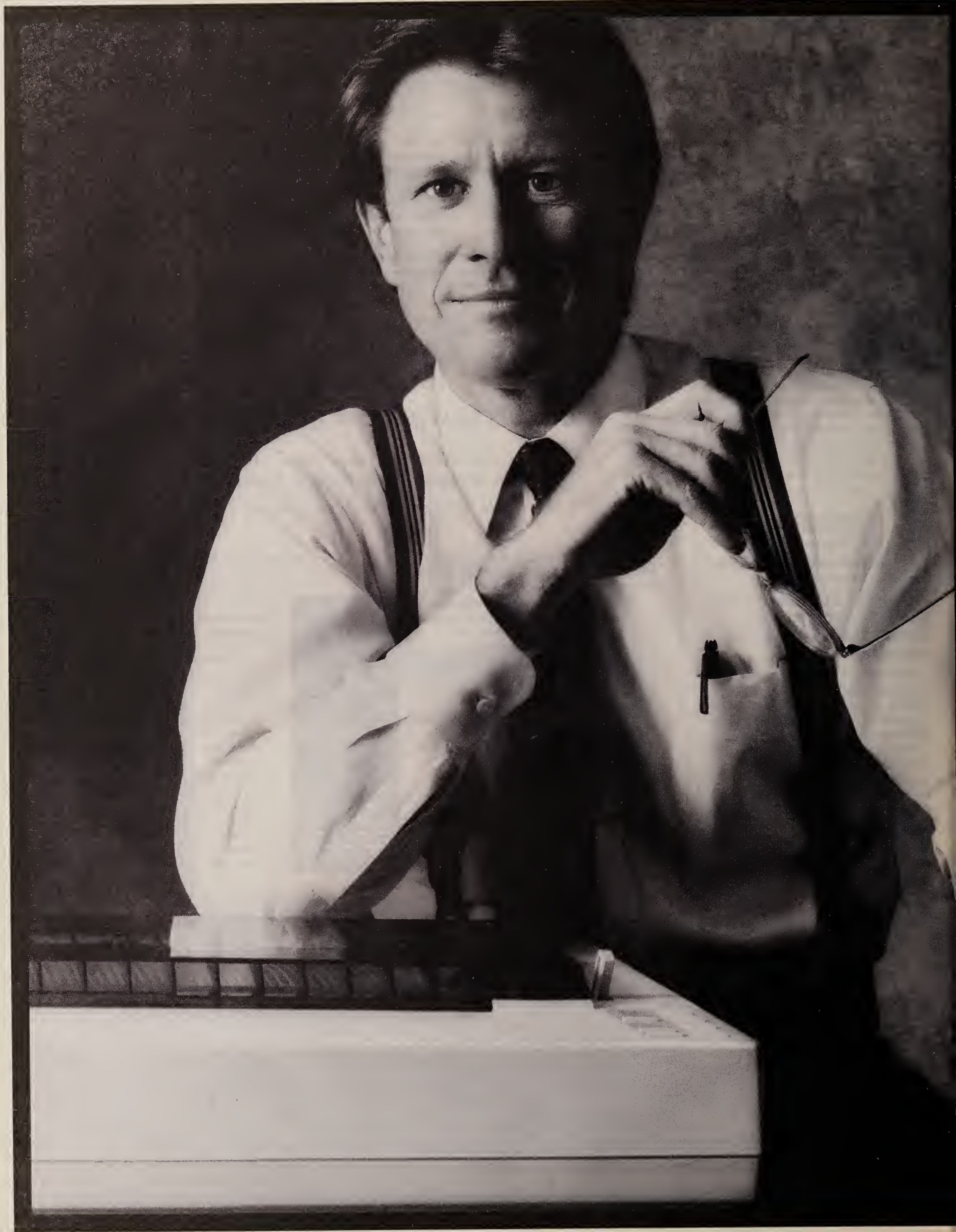
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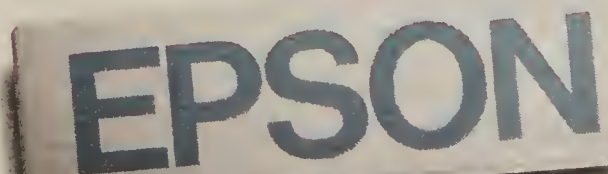
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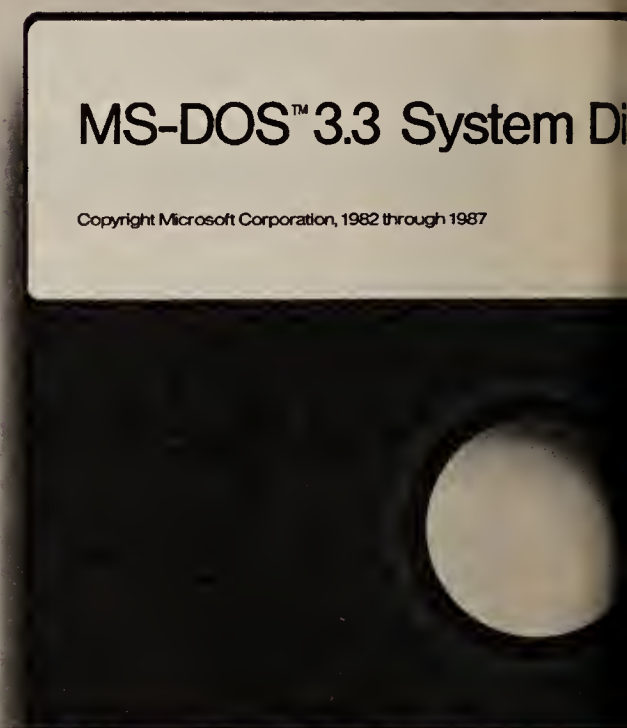
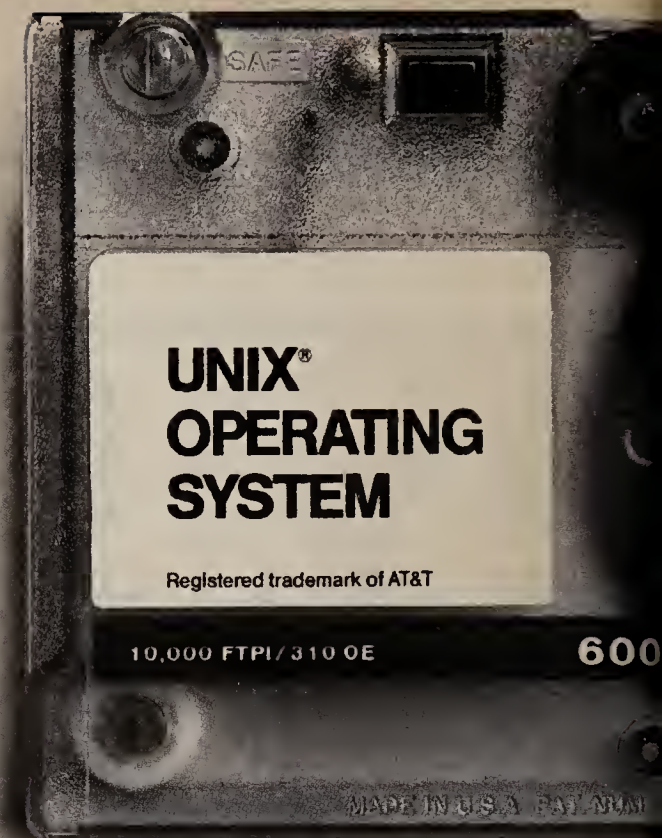
File-transfer software

COMPANY	PRODUCT	CATEGORY DESCRIPTION	SOFTWARE OR SOFTWARE AND HARDWARE	RESIDES ON WHAT PLATFORM	RUNS AS APPLICATION, SYSTEM SOFTWARE OR SYSTEM UTILITY	HOST HARDWARE	HOST ENVIRONMENTS	MICROCOMPUTER MEMORY REQUIRED	DATA FORMATTING	VIRTUAL DISK CREATION	MENU OR COMMAND DRIVEN	TRANSMISSION PROTOCOLS SUPPORTED	TRANSMISSION SPEED	ADDITIONAL HARDWARE OR SOFTWARE SUPPORTED	PRICE
Advanced Information Services (203) 855-1278	Kopy-King Version 3.0	Proprietary file transfer	Software	Micro, mini, mainframe	Application	IBM System 36/38, AS/400, 4300, 370	DOS/VSE-CICS, DL/1, VSAM, MVS-CICS, IMS	256K	Yes	No	Menu	3270, 5251	NP	IBM-compatible PC, 3270 or 5251 emulator board or software	\$1,312 to \$9,625/host
Applied Software, Inc. (407) 626-4818	Host Storage & Retrieval	Proprietary file transfer	Software	Micro, mainframe	System utility	All IBM and compatible mainframes	MVS, TSO, VMS VTAM, VM/CMS	192K	Yes	No	Both	Asynch, synch, bisynch	Hardware dependent	3278 emulation card/software or modem	\$90/micro, \$8,000/host
Aspen Research, Inc. (415) 340-1588	Enter/3270	Distributed application communication	Software	Micro	System utility	Any IBM mainframe	All	250K	Yes	No	Both	3270, 5250	Hardware dependent	None	\$500
AST Research, Inc. (714) 863-1333	AST-FTSII	Terminal emulation with file transfer	Software	Micro, mainframe	Application	IBM 370, 3090, 4300, 9370	MVS, VM/SP, DOS/VSE, ACF/VTAM, ACF/TCAM, TSO, TSO/E, CICS, CMS	100K	Yes	No	Both	SNA/SDLC	Up to 9.6K	None	Bundled with AST-3270 family of products
	AST 5250 File Transfer	Proprietary file transfer	Software	Micro, mini	Application	IBM System/34, 36, 38, AS/400	SSP, CPF, OS/400	40K	Yes	No	Both	Twinax, SNA/SDLC	9.6K to 1M	AST Gateway	Bundled with AST 5250 family of products
AT&T (800) 242-1212	AT&T 3270 Emulator +	Terminal emulation with file transfer	Software	Micro, mini	System software	IBM 3090, 4341 and compatibles	MVS, VM, TSO, CICS, IMS, VTAM	2M to 4M	Yes	No	Menu	BSC, SDLC, WGS	9.6K to 19.2K	Card or controller for synch access, AT&T SNA/LINK software	\$18,000 to \$5,500/micro
	AT&T 3270 RJE Emulator	Standard file transfer	Software	Micro, mini	System software	IBM 3090, 4341 and compatibles	MVS, VM, TSO, CICS, IMS, VTAM	2M to 4M	Yes	Yes	Command	BSC, SDLC, WGS	9.6K to 19.2K	Same as above	\$1,600 to \$3,000/micro
	AT&T HLLAPI/3270	Distributed application communications	Software	Micro, mini	System utility	IBM 3090, 4341 and compatibles	MVS, VM, TSO, CICS, IMS, VTAM	NP	Yes	No	Both	BSC, SDLC, WGS	9.6K to 19.2K	SNA 3270 software	Bundled with 3270 Emulator +
	AT&T Escort/3270	Distributed application communication	Software	Micro, mini	System utility	IBM 3090, 4341 and compatibles	MVS, VM, TSO, CICS, IMS, VTAM	NP	Yes	No	Both	BSC, SDLC, WGS	9.6K to 19.2K	SNA/3270 software	Bundled with 3270 Emulator +
Automated Insurance Resource Systems, Inc. (AIRS) (312) 505-9500	Airlink/AFT	Proprietary file transfer	Software	Micro, mainframe	System utility	IBM and compatible mainframes with 3270 protocol	MVS, CICS	308K	Yes	No	Menu	3270	Any	CXI 3270 emulation boards, gateways with emulation software	NP
Avatar Corp. (508) 438-6872	A 1000/3270 Emulation Program Software	Terminal emulation with file transfer	Software, hardware	Micro, mainframe	Application	IBM 4300, 360, 370, 9370	CICS, TSO, CMS	256K	Yes	No	Menu	IBM 3270 coax Type A	2.35M	IND\$FILE, Avatar host file-transfer program	\$479
	Mac Main Frame Series	Terminal emulation with file transfer	Software, hardware	Micro, mainframe	Application	IBM 4300, 360, 370, 9370	CICS, TSO, CMS	400K to 650K	Yes	No	Menu	IBM 3270 coax Type A	2.35K to 19.2K	Same as above	\$795 to \$1,295
	Host File Transfer Program	Proprietary file transfer	Software	Mainframe	Application	IBM 4300, 9370, 360, 370	CICS, TSO, CMS	NA	Yes	No	Command	SNA, bisynch	Hardware dependent	None	\$500 site license
Barr Systems, Inc. (800) 227-7797	Barr/SNA RJE	Standard and proprietary file transfer, terminal emulation with file transfer, LAN gateway	Software, hardware	Micro, mainframe	Application	IBM 3090 and 370	JES2, JES3, DOS/POWER	320K	Yes	No	Menu	SNA RJE	Up to 128K	None	\$1,590
	Barr/Hasp	Same as above	Software, hardware	Micro, mainframe	Application	IBM 3090 and 370, CDC mainframes	JES2, JES3, VM/RSCS, CDC NOS	256K	Yes	No	Menu	HASP BSC multileaving	Up to 56K	None	\$1,290
Baseline, Inc. (404) 263-9587	Baseline Series	Distributed applications communication	Software	Micro, mainframe	Application	IBM	CICS	256K	Yes	No	Both	SNA	Hardware dependent	Coax, LAN gateway cards	\$395 to \$695/micro
Cambridge Computer Corp. (203) 228-6004	PC 77/78	Terminal emulation with file transfer	Software	Micro	Application	Honeywell DPS 6, 7, 8, 7000, 8000, 9000	GCOS	256K	Yes	No	Both	Honeywell VIP Synch	38.4K	IBM BSC adapter	\$300
	VX * Connect	Terminal emulation with file transfer	Software	Micro	Application	DEC VAX	VMS	512K	No	No	Both	Asynch	19.2K	None	\$245
	Mac 73/78	Terminal emulation with file transfer	Software	Micro	Application	Honeywell DPS 6, 7, 8, 7000, 8000, 9000	GCOS	1M	Yes	No	Both	Asynch	57.6K	None	\$295
	PC 73/78	Terminal emulation with file transfer	Software	Micro	Application	Honeywell DPS 6, 7, 8, 7000, 8000, 9000	GCOS	256K	Yes	No	Both	Asynch	19.2K	None	\$295
Carleton Corp. (617) 272-4310	CQS-Link	Proprietary file transfer, terminal emulation with file transfer, distributed application communication	Software	Micro, mainframe	Application	IBM 360/370, 4300, 3030, 3080, 3090, 9370	VSE, MVS, VM, 750/ISPF, ICCF, CMS, DB2, IMS/DL/1, CICS, IDMS, Adabas, VTAM	400K	Yes	Yes	Both	SNA, bisynch, asynch	19.2K	PL/I Transient library	\$500 to \$8,500

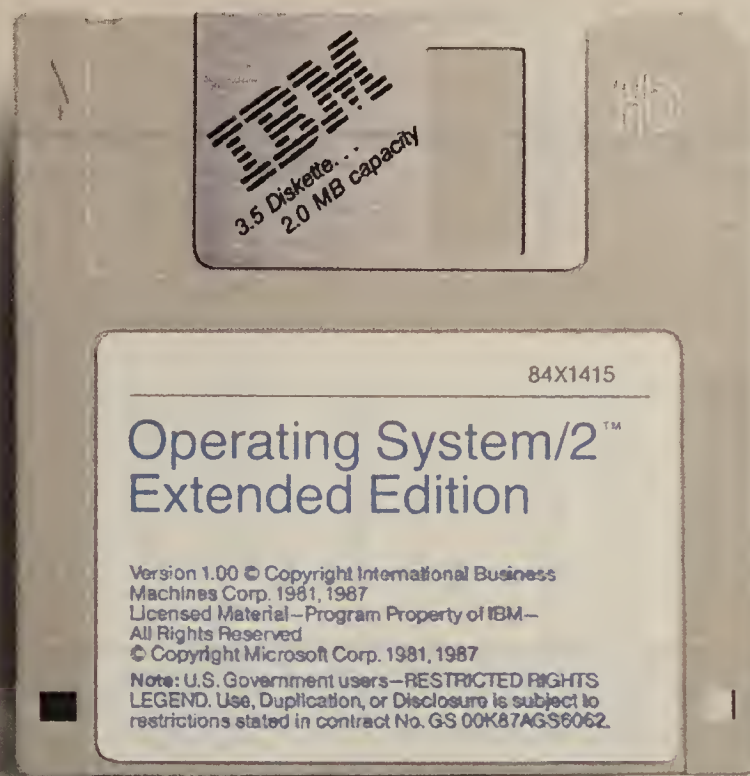
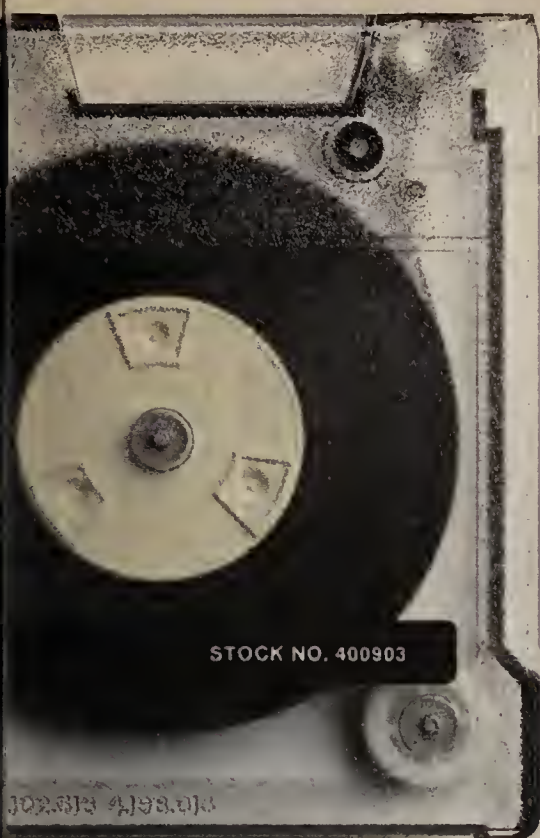
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PRODUCT SPOTLIGHT

COMPANY	PRODUCT	CATEGORY DESCRIPTION	SOFTWARE OR SOFTWARE AND HARDWARE	RESIDES ON WHAT PLATFORM	RUNS AS APPLICATION, SYSTEM SOFTWARE OR SYSTEM UTILITY	HOST HARDWARE	HOST ENVIRONMENTS	MICROCOMPUTER MEMORY REQUIRED	DATA FORMATTING	VIRTUAL DISK CREATION	MENU OR COMMAND DRIVEN	TRANSMISSION PROTOCOLS SUPPORTED	TRANSMISSION SPEED	ADDITIONAL HARDWARE OR SOFTWARE SUPPORTED	PRICE
CFS Software, Inc. (800) 234-9884	PCmainframe	Proprietary file transfer	Software	Micro, mainframe	Application	IBM 370	DOS/VSE, DOS/VSE SP, OS/VS1, SSX, MVS, MVS/XA, CICS	128K	Yes	No	Both	Asynch, bisynch, ASLC	19.2K	Protocol converter, emulation card or LAN gateway	\$7,500 to \$10,000
	Across the Boards	Distributed application	Software	Micro, mainframe	System utility	IBM 370	DOS/VSE, DOS/VSE SP, OS/VS1, SSC/MVS, MVS/XA, CICS	50K	Yes	No	Command	Asynch, bisynch, ASLC	19.2K	Same as above	\$5,000 to \$10,000
Cincom Systems (513) 662-2300	PC Contact	Terminal emulation with file transfer	Software	Micro, mainframe	Application	IBM 4300, 3030, 3080, 3090	MVS, DOS, VSE	128K	Yes	No	Menu	Bisynch	Hardware dependent	Mantis	\$500/micro, \$20,000 to \$38,000/host
Codex Corp. (617) 364-2000	4255 SNA Gateway	Proprietary file transfer	Software, hardware	VTAM, NCP	System software	IBM and compatible communications controllers running NCPC	MVS, MVS/XA	NA	Yes	No	Command	Asynch, bisynch	19.2K	None	\$4,600 to \$12,100
Coefficient Systems Corp. (212) 777-7318	Vterm Series	Terminal emulation with file transfer	Software	Micro	Application	All DEC VAXs, all IBM through a protocol converter	VMS	256K to 512K	No	No	Menu	Kermit, Xmodem, ASCII, proprietary binary protocol	50 to 19.2K	None	\$195 to \$995
Communications Research Group (504) 923-0888	Blast Communications Software	Terminal emulation with file transfer, distributed application communication	Software	Micro, mini, mainframe	Application	IBM mainframes, Amdahl, DEC VAX, PDP, RT-11 TSX, Prime, HP 3000/MPE 1000, all Data General, Wang VS, AT&T 3B series, Harris VOS, NCR Tower, Unisys	VM/CMS, MVS/TSO, VMS, MPE, VOS, BTOS/CTOS, CP/M, Unix Xenix, SCO Xenix	256K	Yes	No	Both	ASCII, Xmodem, Blast	38.2	None	Starts at \$195/micro
Computer Associates International, Inc. (800) 237-9273, in N.J. call (201) 874-9000	CA-Datquery VAX	Proprietary file transfer	Software, hardware	Mainframe	Application	IBM 4300, 3080, 3090 or compatible, DEC Microvax, Vaxstation, Vaxstation II, VAX	VSE, VSE/SP, MVS/CICS VM/CICS, VAX/VMS	280K	Yes	No	Both	DECnet/SNA gateway, VMS/SNA environment	Hardware dependent	CA-Datcom/DB, CA-Data Dictionary, CA-Data Query	NP
	CA-PC Datcom	Proprietary file transfer	Software	Micro, mainframe	Application	IBM 4300, 3080, 3090 and compatible	VSE, VSE/SP, MVS/CICS VM/CICS	280K	Yes	No	Both	IBM BSC, SDLC, RS-232, VT100	Hardware dependent	Same as above	\$695/micro
	PC-Email File Transfer	Proprietary file transfer	Software	Micro, mainframe	Application	All IBM mainframes	DOS/VSE, MVS, MVS/XA, VM/CMS, Roscoe, TSO, CICS	512K	Yes	No	Both	SDLC, asynch	1.2K	CA-Email	\$195/micro
Computer Corp. of America (617) 492-8860	PC/204	Proprietary file transfer	Software	Micro, mainframe	Application	IBM and PCM	DOS, CMS	512K	Yes	Yes	Both	Asynch, coax	1.2K to 9.6K	Model 204 DBMS	\$500/micro
Computer Vectors, Inc. (800) 262-7266	Room/ Hydra II	Terminal emulation with file transfer	Software, hardware	Micro, mainframe	Application	All IBM mainframes	DOS VSE, VM/CMS, DOS/VSE CICS, MVS/CICS	38K	No	No	Both	Xmodem, X-on/X-off, proprietary	115K	None	\$129 to \$5,000
Concurrent Computer Corp. (800) 631-2154	PENnet PC	Proprietary and standard file transfer, terminal emulation with file transfer, distributed application communication, LAN gateway	Software	Micro, mini	All	Concurrent Series 3200, 5000, 6000	Concurrent OS/32, XELOS, RTU, Reliance Plus database	512K	Yes	No	Both	OSI	50K	PC Ethernet interface	\$500
Corporate Microsystems, Inc. (603) 448-5193	Mlink	Terminal emulation with file transfer	Software	Micro, mini	System utility	Unix-based mainframes	Unix	250K	No	No	Menu	Kermit, Xmodem, proprietary	19.2K	None	\$195 to \$750/micro
Corvus Systems, Inc. (800) 4-Corvus	Nostalk	LAN gateway	Software	Micro	System software	Any asynch	Any asynch	160K	No	No	Both	Asynch	19.2K	PC/NOS	Bundled with PC/NOS
CQ Computer Communications (904) 562-4255	CQ-3270R	Terminal emulation with file transfer	Software	Micro	Application	Any VTAM host	Any IBM environment	200K	No	No	Menu	IBM SDLC, LU1, LU2, LU3	Hardware dependent	None	\$395 to \$795/micro
Crosstalk Communications (404) 998-3998	Crosstalk	Terminal emulation with file transfer	Software	Micro	Application	IBM mainframes supporting IBM 3101 terminal access, DEC VAX	NP	256K	No	No	Both	Crosstalk, Dart, Xmodem, Ymodem, Kermit, CompuServe-B	115K to 300K	None	\$245
	Crosstalk XVI	Terminal emulation with file transfer	Software	Micro	Application	IBM mainframes supporting IBM 3101 terminal access, DEC VAX	NP	256K	No	No	Both	Crosstalk, Dart, Xmodem, Ymodem, Kermit, CompuServe-B	115K to 300K	None	\$195
Cullinet Software, Inc. (800) 551-4555	Information Center Management System	Standard file transfer	Software	Micro, mainframe	Application	IBM 370, 4300, 3030, 3080, 3090, 9370	OS/VS1, OS/VS2, MVS, MVS/XA, VM/CMS, DOS/SP, DOS/VS, DOS/VSE	384K	Yes	Yes	Both	TTY, VT100, VT52, SDLC	Hardware dependent	None	\$28,000 to \$75,000
Datability Software Systems, Inc. (212) 807-7800	RAF Remote Access Facility	Proprietary file transfer	Software, hardware	Micro, mainframe	System software	VAX/VMS	VMS	90 to 120K	Yes	Yes	Command	Proprietary	Up to 100K	Ethernet card	\$395/micro
DataEase International, Inc. (203) 374-8000	DataEase Connect	NP	Software	Micro	Application	IBM 370, 4300, 3000	DOS/VS, MVS/370, MVS/XA, CICS, TOS, CMS, IMS/DB, ISAM, DB2, DL/I, VSAM, QSAM	640K	Yes	No	Menu	Bisynch, SDLC	1200 to 19.2K	IBM 3278, 3274, Sterling Software DB	\$995
Data General Corp. (508) 366-8911	CEO Connection	Terminal emulation with file transfer	Software	Micro, mini	Application	DG Eclipse/MV	AOS/VS	256K	Yes	No	Menu	Asynch, Blast	Up to 9.6K	None	\$295/micro
DecisionLink, Inc. (714) 731-4832	DecisionLink	Proprietary file transfer	Software	Micro, mini	Application	IBM S/34, 36, 38, AS/400	NA	80K	Yes	No	Menu	NA	120K to 220K	5250 emulation board	\$400/host
	PC Connect	Proprietary file transfer	Software	Micro, mini	Application	IBM S/34, 36, 38, AS/400	NA	70K	Yes	No	Menu	NA	100K to 200K	Same as above	\$1,000 to \$2,000/host
	Data Base Access/36	Proprietary file transfer	Software	Micro, mini	Application	IBM S/36	NA	80K	Yes	No	Menu	NA	120K to 220K	Same as above	\$1,200/host
	456/X	Proprietary file transfer	Software	Micro, mini	Application	IBM S/34, 36, 38, AS/400	NA	70K	Yes	No	Menu	NA	120K to 220K	Same as above	\$250/micro
	Hands Off	Proprietary file transfer	Software	Micro, mini	Application	IBM S/34, 36, 38, AS/400	NA	80K	Yes	No	Menu	NA	NA	Same as above	\$250/micro



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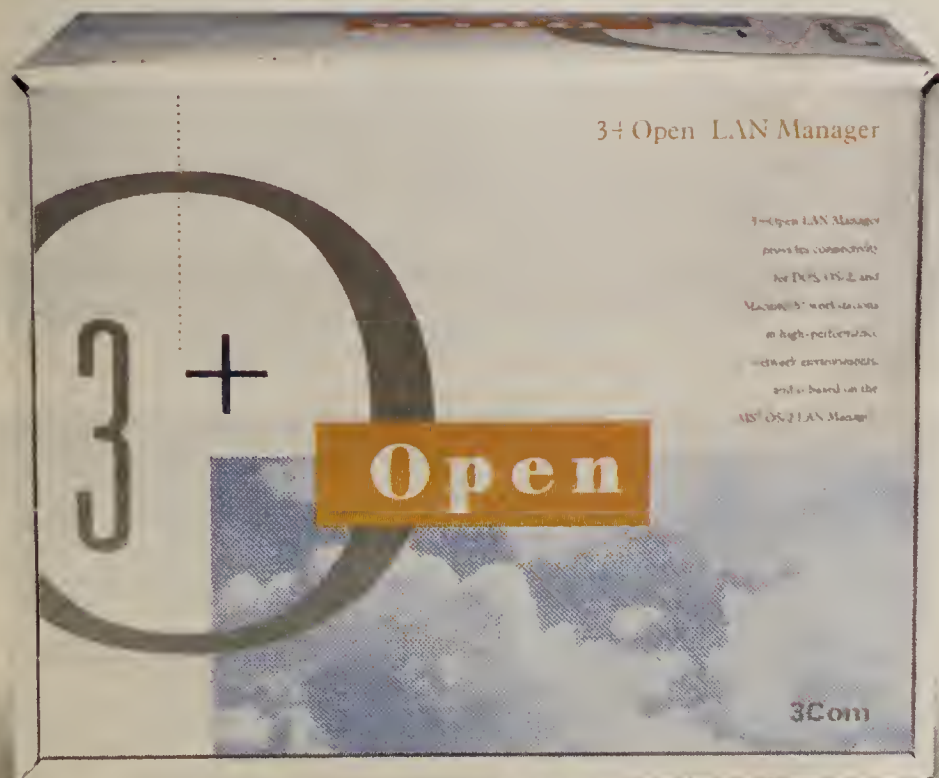
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COMPANY	PRODUCT	CATEGORY DESCRIPTION	SOFTWARE OR SOFTWARE AND HARDWARE	RESIDES ON WHAT PLATFORM	RUNS AS APPLICATION, SYSTEM SOFTWARE OR SYSTEM UTILITY	HOST HARDWARE	HOST ENVIRONMENTS	MICROCOMPUTER MEMORY REQUIRED	DATA FORMATTING	VIRTUAL DISK CREATION	MENU OR COMMAND DRIVEN	TRANSMISSION PROTOCOLS SUPPORTED	TRANSMISSION SPEED	ADDITIONAL HARDWARE OR SOFTWARE SUPPORTED	PRICE
Digital Communications Associates, Inc. (800) 241-4762 Ext. 734, in Ga. call (404) 442-4000 Ext. 734	FT/Express TSO and FT/Express CMS	Proprietary file transfer	Software	Micro, mainframe	System utility	IBM 370/XA	MVS SP/XA TSO, TSO/E, VM SP, XA CMS	64 to 180K	Yes	No	Both	3270 SNA/SDLC	21K	None	\$9,000/host
	Irmalink FT/TSO & FT/CMS	Proprietary file transfer	Software	Micro, mainframe	System utility	IBM 370/XA	IBM MVS/SP, VMS/TSO, VM/SP, VM/CMS	180K	Yes	No	Both	3270	300 to 1.2K	None	Bundled with DCA 3270 EMU
	Irmalan SNA Workstation	Terminal emulation with file transfer	Software	Micro	Application	IBM 3705, 3720, 3725, 3745 communications controller, IBM 3174, 3274, 3874 control unit	SNA	177K to 884K	No	No	Both	SNA/SDLC, 802.2	Up to 16M	LAN interface card, IBM Netbios-compatible card	\$395
	Irmalan 802.2 Gateway	LAN gateway	Software	Micro	Application	IBM 3720, 3725, 3745 communications controller, IBM 3174 control unit	SNA	231K to 300K	No	No	Both	IEEE DLC 802.2	Up to 16M	Communications controller, token-ring interface, LAN interface card	\$595
	Irmalan SDLC Gateway 2	LAN gateway	Software, hardware	Micro	Application	IBM 3705, 3720, 3725, 3745 controllers	SNA	133K to 640K	No	No	Both	IBM 3270 SNA/SDLC, EBCDIC	Up to 72K	LAN interface card, IBM Netbios-compatible LAN	\$1,195
	Irmalan DFT Gateway 2	LAN gateway	Software, hardware	Micro	Application	IBM 3174, 3274 cluster controllers	SNA	133K to 640K	No	No	Both	IBM 3270 Datastream, DFT	2.3M	Same as above	\$1,195
Digital Equipment Corp. Contact local DEC sales office	PCSA CUENT/VMS Service for MS-DOS	Standard and proprietary file transfer, terminal emulation with file transfer, distributed application communication, LAN gateway	Software, hardware	Micro, mini	System software, system utility	All DEC VAXs	VMS	256K	Yes	Yes	Command	Decnet, MS-Net, Netbios	10M	Ethernet card	NP
Dynacomp, Inc. (716) 265-4040	Easy Access	Standard file transfer	Software	Micro	System software	Any that support Xmodem protocol	Any that support Xmodem protocol	256K	Yes	Yes	Both	Xmodem	Modem dependent	None	\$29.95
Dynamic Microprocessor Associates, Inc. (212) 687-7115	Ascom IV	Terminal emulation with file transfer	Software	Micro	Application	All hosts with asynch file transfer	NA	256K	No	Both	Both	Xmodem, Kermit, X-on/X-off, CRLF	50 to 19.2K	None	\$195/micro
ESI (904) 575-0179	Group Four Micropulse	Distributed Application communication	Software	Micro, mainframe	Application	Unisys A, V, and B1000	Unisys MCP, COMS, GEMCOS, SMCS, DMS II	640K	Yes	Yes	Both	ICC, Handshake, Core Technologies Datamaxx card	Protocol dependent	None	\$10,960 to \$34,040/host
Fel Computing (617) 236-1200	Mobius	Standard and proprietary file transfer, terminal emulation with file transfer, distributed application communication	Software	Micro, mini	Application	DEC VAX, System 10/20	VMS, TOPS 10, 20	125K	No	Yes	Both	Proprietary, XNS	Up to 19.2K	None	\$250 to \$325/micro
Gateway Communications, Inc. (714) 553-1555, (800) 367-6555	G/SNA Gateway	LAN gateway	Software, hardware	Micro	Application	IBM 370, 4300, 3030, 3080, 3090	CICS, TSO, CMS	384K	Yes	No	Both	SNA/SDLC	56K	None	\$2,580 to \$4,580
GE Information Services (800) 433-3683	The Business Talk System	Distributed application communication	Software	Micro, mainframe	Application	GE Mark II Service (Honeywell mainframes)	GE Mark III Service	512K	No	No	Menu	Proprietary	Hardware dependent	None	\$20,000
	PC Mailbox	Distributed application communication	Software	Micro, mainframe	Application	GE Mark II Service (Honeywell mainframes)	GE Mark III Service	384K	No	No	Menu	Xmodem, proprietary	Hardware dependent	None	\$249/micro
Hayes Microcomputer Products, Inc. (404) 441-1617	Smartcom II for the IBM PC	Terminal emulation with file transfer	Software	Micro	Application	All with VT100, VT102 and VT52 emulation	NP	384K	No	No	Menu	Xmodem checksum, CRC, Ymodem-G, Hayes Verification	110 to 19.2K	None	\$149
	Smartcom II for the Macintosh	Terminal emulation with file transfer	Software	Micro	Application	NP	NP	512K	NP	No	Menu	Xmodem checksum, CRC, ACK-ahead, Ymodem, Ymodem-G	110 to 38.4K	None	\$149
	Smartcom III	Terminal emulation with file transfer	Software	Micro	Application	NP	NP	512K	NP	No	Menu	Xmodem checksum, CRC, ACK-ahead, Ymodem, Ymodem-G, Kermit	110K to 115.2K	None	\$249
Headlands Communications Corp. (415) 435-0770	PC-Talk IV/PC-Talk III	Standard file transfer	Software	Micro, mainframe	Application	All with VT100 and VT52 emulation	NP	64K (IV), 192K (III)	Yes	Yes	Both	Xmodem	300 to 9.6K	None	\$35 (III), \$99 (IV)
Hewlett-Packard Co. (415) 857-1501	HP Advance Link/Office Share	Standard file transfer	Software	Micro, mini	Application, system software	DEC VAX, IBM 370	MPE, HP/UX, VMS, MS-DOS	NP	Yes	No	Both	NP	Depends on link	None	NP
Hilgraeve, Inc. (313) 243-0576	Hyperaccess	Standard and proprietary file transfer, terminal emulation with file transfer	Software	Micro	Application software	Any asynchronous device	Any asynchronous	192K	No	No	Menu	Xmodem, Kermit, proprietary	50K to 57.6K	None	\$149/micro
Holos Software, Inc. (404) 496-1358	CW/Call Whomever	Standard and proprietary file transfer, terminal emulation with file transfer	Software	Micro, mini	Application, system utility	AT&T 3B and WGS, NCR Tower, Masscomp	Unix, Xenix	Less than 512K	No	No	Command	Xmodem, Crosstalk	19.2K	None	\$295
	XO/Crossover	Standard and proprietary file transfer	Software	Micro, mini	Application, system utility	AT&T 3B and WGS, NCR Tower	Unix, Xenix	Less than 512K	No	No	Command	Xmodem, Crosstalk	19.2K	None	\$195 and up
Honeywell Bull, Inc. (617) 895-6000	VIP3	Terminal emulation with file transfer	Software	Micro	Application	Honeywell Bull DPS	COS 6, 7, 8	384K	No	No	Both	Kermit	9.6K	None	\$400
Houston Computer Services, Inc. (713) 568-9900	Octacomm-Link	Proprietary file transfer	Software	Mainframe	Application	TI Business System 300, 600, 800, 990	NP	NA	Yes	No	Menu	Proprietary	110 to 9.2K	None	\$395

MICRO-TO-HOST LINKS
PRODUCT SPOTLIGHT

COMPANY	PRODUCT	CATEGORY DESCRIPTION	SOFTWARE OR SOFTWARE AND HARDWARE	RESIDES ON WHAT PLATFORM	RUNS AS APPLICATION, SYSTEM SOFTWARE OR SYSTEM UTILITY	HOST HARDWARE	HOST ENVIRONMENTS	MICROCOMPUTER MEMORY REQUIRED	DATA FORMATTING	VIRTUAL DISK CREATION	MENU OR COMMAND DRIVEN	TRANSMISSION PROTOCOLS SUPPORTED	TRANSMISSION SPEED	ADDITIONAL HARDWARE OR SOFTWARE SUPPORTED	PRICE
IBM Contact local IBM dealer	IBM 3270 Workstation Program Version 1.12	Terminal emulation with file transfer	Software	Micro	Application, system utility	IBM 370	NP	384K to 640K	Yes	NP	Command	LU2, DFT, Token-Ring	NP	DOS adapter for DFT or Token-Ring	NP
	IBM PC 3270 Emulation Program Version 3	Terminal emulation with file transfer, LAN gateway	Software	Micro	Application, system utility	IBM 370	NP	256K	Yes	No	Command	DFT, BSC, SDLC, Token-Ring, LU2, LU3	NP	DOS adapter for DFT or BSC, SDLC, Token-Ring	NP
	IBM PC 3270 Emulation Program Entry Level Version 1.20	Terminal emulation with file transfer	Software	Micro	Application, system utility	IBM 370	NP	128K	Yes	No	Command	3270 data stream, LU2, DFT	NP	DOS adapter for DFT	NP
	IBM Operating System/2 Extended Edition 1.1	Terminal emulation with file transfer	Software	Micro	System software, system utility	IBM 370	NP	3M	Yes	No	Both	3270 data stream, LU2, DFT, SDLC, Token-Ring, Xmodem, Asynch	NP	Adapter for DFT, SDLC, Token-Ring	NP
Icot Network Systems Division (800) 343-0515	pc Path SNA-5250	Terminal emulation with file transfer	Software, hardware	Micro, mini	Application	IBM System/36, 38, AS/400	IBM SSP	200K	Yes	No	Both	SDLC	9.6K	None	\$695
Ideassociates, Inc. (617) 663-6878	Ideacomm 3278 family	Terminal emulation with file transfer, LAN gateway	Software, hardware	Micro, mainframe	System utility	IBM 370	MVS, MVS/XA, VS/CICS, VM/CMS	28K minimum	Yes	No	Both	SNA/SDLC, BSC	Up to 2.45M	None	NP
Infocentre Corp. (416) 678-1841	Speedware Environment, T.O.U.R.S., Speedledger	Distributed application communication	Software	Micro, mini	Application, system utility	HP 3000	MPE, MPE/V, MPE-XL	512K	No	No	Menu	NP	NP	None	\$12,000 to \$125,000
Intercomputer Communications Corp. (513) 745-0500	ICC/Intercom 102-ICC/File-Xpress	Terminal emulation with file transfer	Software	Micro, mainframe	Application software	Unisys A, V, B series	BTOS/CTOS	35K to 512K	Yes	Yes	Both	Unisys Poll/Select	75 to 38.4K	NP	\$495/micro, \$995/mainframe
Interlink Computer Sciences, Inc. (415) 657-9800	SNS/SNA Gateway	Standard file transfer	Software, hardware	Mainframe	Application	IBM 370 or PCM	MVS, MVS/ESA, VM	NA	Yes	No	Both	DECnet DNA	1M and above	Ethernet adapter	\$29,900 to \$200,000/host
Kaz Business Systems (212) 757-9566	Front End	Standard file transfer, terminal emulation with file transfer	Software	Micro	Application	All hosts with VT100 terminal capability	NP	380K	No	No	Both	Xmodem, ASCII, Macbinary	300 to 19.2K	None	\$120 to \$179
KEA Systems Ltd. (604) 732-7411	ZSTEM	Terminal emulation with file transfer	Software	Micro	Application	DEC VAX	VMS, Unix	360K	Yes	No	Both	X-on/X-off, Kermit, Xmodem	115K to 200K	None	\$295
Local Data, Andrew Network Products (213) 320-7126	Trulynx 3270	Terminal emulation with file transfer	Software	Micro, mainframe	System utility	IBM 370	CICS, TSO, MVS	NP	NP	No	Command	IND\$FILE	19.2K	None	\$1,030
Mackensen Corp. (213) 452-5520	File Transfer System	Standard and proprietary file transfer	Software	Micro, mainframe	Application	IBM 370	MVS, VM/SP, DOS, TSO, CMS, CICS, IMS, IDMS, FTS/VTAM, FTS/SR, VM/SP CMS, CICS/VS	100K	Yes	No	Both	3270 datastream, 3270 A Coax, RS-232, Token-Ring	Any supported by network	None	\$10,000/host
McCormack & Dodge (508) 655-8575	PC Link 3.0	Proprietary file transfer	Software	Micro, mainframe	Application	IBM 3030, 3080, 3090, 4300	OS/2, DOS	256K	Yes	No	Both	Asynch, synch, coax	Hardware dependent	Emulation board and software	\$1,100 to \$35,000
Microplot Systems (614) 882-4786	PC-Plot-IV Plus	Terminal emulation with file transfer	Software	Micro	Application	All with Xmodem or Kermit	All with Xmodem or Kermit	256K	No	No	Menu	Xmodem, Kermit	110 to 19.2K	None	\$195
Micro Decisionware (303) 433-2706	JPC/SQL-Link	Distributed application communication	Software	Micro, mainframe	Application	IBM 3090, 4300, 3030, 3080, 3130, 3120, 9370, 4570, Amdahl 5800 series	MVS/TSO, MVS/CICS, VM/CMS, SQL/DS, DB2, PDQ, RDBC	320K	Yes	No	Both	Communications dependent	Hardware dependent	None	\$600
Microgate Corp. (formerly Gateway Microsystems) (800) 444-1982	Microgate 3780/API	Terminal emulation with file transfer	Software, hardware	Micro	System utility	IBM 370	IBM MVS, VSE	256K	Yes	No	Command	2780/3780 BSC	2.4K to 19.2K	None	\$595 to \$1,495
	Microgate 3270/SNA	Terminal emulation with file transfer	Software, hardware	Micro	Application	IBM 370	MVS/TSO, CICS/VS, VM/CMS, ACF/VTAM	512K	Yes	No	Command	SNA, SDLC	2.4K to 19.2K	None	\$595 to \$1,495
	Microgate 3780	Terminal emulation with file transfer	Software, hardware	Micro	Application	IBM 370, DEC PDP and VAX lines	IBM MVS, VSE	256K	Yes	No	Command	2780/3780 BSC	2.4K to 19.2K	None	\$595 to \$1,495
Modular Computer Systems, Inc. (Modcomp) (305) 974-1380	Kermit	Standard file transfer	Software	Mini	Application	Modcomp Classic II, Classic 32, Classic Tri-D Systems	Max IV, Max 32, Realix	2M	No	No	Command	RS-232	19.2K	DCS Line Interface Module	Included in Communications Workbench Package (\$6,500)
	TCP/NET	Standard file transfer	Software, hardware	Mini	Application	Modcomp Classic II, Classic 32, Classic Tri-D Systems	Max IV, Max 32	2M	No	No	Both	TCP/IP, IEEE 802.3	3M	Ethernet controller, transceivers, cable, IPS-Z	\$10,000 including Ethernet controller
Multi Soft, Inc. (609) 896-4100	SDF	Proprietary file transfer	Software	Micro, mainframe	Application	IBM System 370, DEC VAX	TSO, CMS, IDMS/DC, VMS	512K	Yes	No	Both	Asynch, ADLC, BSC	19.2K	Serial port, emulation card	\$9,000/host
	Infront/HPO	Distributed application communication	Software	Micro, mainframe	System utility	IBM System 370, DEC VAX	TSO, CMS, CICS, IDMS/DC, VMS	640K	Yes	No	Both	Asynch, SDLC, BSC	19.2K	Serial port, emulation card	\$25,000/host
Network Software Associates, Inc. (714) 768-4013	AdaptSNA RJE	Standard file transfer	Software	Micro, mainframe	System utility	Any IBM mainframe	JES2, JES3, POWER	256K	Yes	No	Command	SNA, SDLC	19.2K	None	\$785/micro
	AdaptSNA 3270	Terminal emulation with file transfer	Software	Micro, mainframe	System utility	Any IBM with IND\$FILE	CICS, TSO, CMS	256K	Yes	No	Both	SNA, SDLC	Up to 19.2K	None	\$245/micro
Northwest Digital Software (509) 447-5631	The Link for PDP Clustering	Distributed application communication	Software	Mini	System software	All DEC PDP-11s	RSTS/E	256K	Yes	No	NA	Direct disk file transfer	1M	DEC communications boards	\$10,000/2-node license
Novell, Inc. (408) 747-4000	Netware 3270 Send-Receive	Standard file transfer	Software	Micro	Application	IBM 4300, 3030, 3090	TSO, CMS, CICS using IND\$FILE	NP	Yes	No	Command	Coax, SDLC, BSC, Token-Ring	NA	Netware/PCCX, 3270 emulation	Included with LAN and standalone 3270 emulation software
OBS Software (415) 362-8010	Excellink & Excellink Host/V	Proprietary file transfer, terminal emulation with file transfer, distributed application communication	Software	Micro, mainframe	System software	MVS, VM	IBM MVS, VM	128K	Yes	No	Both	Asynch, bi-synch, SNA	Hardware dependent	None	\$12,500 to \$15,000

COMPANY	PRODUCT	CATEGORY DESCRIPTION	SOFTWARE OR SOFTWARE AND HARDWARE	RESIDES ON WHAT PLATFORM	RUNS AS APPLICATION, SYSTEM SOFTWARE OR SYSTEM UTILITY	HOST HARDWARE	HOST ENVIRONMENTS	MICROCOMPUTER MEMORY REQUIRED	DATA FORMATTING	VIRTUAL DISK CREATION	MENU OR COMMAND DRIVEN	TRANSMISSION PROTOCOLS SUPPORTED	TRANSMISSION SPEED	ADDITIONAL HARDWARE OR SOFTWARE SUPPORTED	PRICE
On-line Software International, Inc. (201) 592-0009	Ramis/PC Workstation	Proprietary file transfer, terminal emulation with file transfer, LAN gateway	Software	Micro, mainframe	System utility	IBM 4300, 3030, 3080, 3090	VM/CMS, MVS/TSO, MVS/CICS, DOS/CICS, Ramis	640K	Yes	No	Both	Proprietary	1200 to 2.1M	None	\$495/micro
Pacer Software, Inc. (619) 454-0565	Pacer Link	Terminal emulation with file transfer	Software	Micro, mini	System software	Any running VAX/VMS, Ultrix, Sun, Apollo, Cray, Stratus/VOS, Data General AOS/VS	VMS-Ultrix, Unix, VOS, AOS/VS	512K	Yes	Yes	Menu	NP	NP	Ethertalk card	Starts at \$2,000 for 5 concurrent sessions
Packaged Solutions, Inc. (516) 752-1640	Bicomm-3700	Terminal emulation with file transfer	Software, hardware	Micro	Application	IBM S/34, 38, 360, 370, 4300, 2770, 3741, 2780, 3780, DEC VAX, PDP-10, PDP-11	MFT, MVT, OS, JES, Power	64K	Yes	No	Menu	Bisynch	19.2K	None	\$895
	Ascomm-4000	Terminal emulation with file transfer	Software	Micro	Application	All with asynch port	NP	256K	No	No	Menu	Asynch	19.2K	None	\$195
Pansophic Systems, Inc. (312) 505-6000	The Corporate Tie	Standard file transfer	Software	Micro, mainframe	Application, system utility	All IBM mainframes	MVS/CICS, VSE/CICS	60K	Yes	Yes	Both	3270, Asynch	Hardware dependent	None	NP
Persoft, Inc. (608) 273-6000	Smartmove	Terminal emulation with file transfer	Software	Micro	Application	All with VT100, VT102 and VT52 emulation	NP	256K to 320K	No	No	Menu	Xmodem, Kermit	75 to 19.2K	None	\$149/micro
	SmartTerm 240	Terminal emulation with file transfer	Software	Micro	Application	All with VT340, VT241, VT240, VT220, VT100/102, VT52 or Tektronix 4014 emulation	NP	512K	NP	No	Menu	Kermit, Xmodem, proprietary	75 to 19.2K	Graphics adapter	\$345
Polygon, Inc. (314) 576-7709	Poly-XFR	Proprietary file transfer	Software	Micro, mini	Application	All DEC VAX, PDP-11	VMS, RSX-11, RT-11	30K	Yes	No	Command	Any supported by IBM, DEC, 3Com, Novell, Excelan, Ungermann-Bass, Sytek	19.2K	None	\$149/micro, \$585/host
	Poly-COM	Terminal emulation with file transfer	Software	Micro	Application	All DEC VAX, PDP	NP	130K	Yes	No	Both	Same as above	19.2K	NP	\$179/micro
	Poly-STAR	Terminal emulation with file transfer	Software	Micro	Application	All DEC VAX, PDP	NP	300K	Yes	No	Both	Same as above	19.2K	NP	\$199/micro
Prime Computer, Inc. (508) 655-8000	PC-Interface	Terminal emulation with file transfer	Software	Micro, mini	Application	Prime EXL Series	Unix	50K	Yes	Yes	Command	RS-232 asynch, Ethernet	9.6K	None	\$150 to \$1,500
	Primelink	Terminal emulation with file transfer	Software	Micro, mini	Application	Prime 50	Primos	150K	NP	Yes	Both	Asynch	9.6K	None	\$95/micro, \$10,250/host
Rabbit Software Corp. (800) 722-2482	Rabbitstation Coax	Standard file transfer	Software, hardware	Micro	Application	IBM 4300 and later	MVS/TSO, VM/CMS, CICS	34K	Yes	No	Both	BSC, SNA/SDLC via controller	Hardware dependent	None	\$1,095
Relational Technology, Inc. (800) 446-4737 or (415) 769-1400	PC Link	Terminal emulation with file transfer	Software	Micro, mini	Application	All DEC VAX, Sun-3/4, Apollo DN, AT&T 3B, HP 9000, IBM 4300, NCR Tower, Unisys 5000/7000	VMS, Ultrix, Unix, VM CMS, AIX, AUX, HP/UX, OSX, DYNAX, Sun OS	256K	Yes	Yes	Both	Asynch	110 to 19.2K	None	\$200/micro
Relay Communications, Inc. (800) 847-3529	Relay Gold	NP	Software	Micro, mainframe	Application	IBM 4300, 3030, 3080, 3090	VM, VM/VTAM, MVS/TSO, MVS/VTAM	192K	NA	No	Both	Xmodem, Xmodem CRC, Kermit, proprietary	38.4K	None	\$295/micro
	Relay/150	NP	Software	Micro, mainframe	Application	Same as above	VM, VM/VTAM, MVS/TSO, MVS/VTAM	192K	NA	No	Both	Same as above	38.4K	None	\$5,500 to \$14,500/host
	Relay/VM	NP	Software	Micro, mainframe	Application	Same as above	VM, VM/VTAM, MVS/TSO, MVS/VTAM	192K	NA	No	Both	Same as above	38.4K	None	\$5,500 to \$14,500/host
	Relay/3270	NP	Software	Micro, mainframe	Application	Same as above	VM, VM/VTAM, MVS/TSO, MVS/VTAM	192K	NA	No	Both	Same as above	38.4K	None	\$5,500 to \$14,500/host
The Santa Cruz Operation, Inc. (408) 425-7222	SCI Unipath SNA 3270	Terminal emulation with file transfer	Software	Micro	System software	All hosts with remote 3274 connections	SCO Xenix	1M	Yes	No	Menu	SDLC	2.4K to 9.6K	Synch serial card	\$595 to \$2,095/micro
SAS Institute, Inc. (919) 467-8000	The SAS System	Proprietary file transfer	Software	Micro, mini, mainframe	Application	IBM 370, 3030, 3080, 3090, 4300, 9370, DEC VAX/VMS	OS, CMS, VMS	640K	Yes	No	Both	Asynchronous, CXI, Irma, Rabbit, 3270PC, 3278/39	19.2K	NP	NP
Simware, Inc. (613) 727-1779	SIMPC Mac3270	Terminal emulation with file transfer	Software	Micro, mainframe	Application	IBM 370, DEC VAX	MVS/VTAM, VM/SP, CICS	384K to 585K	Yes	No	Both	Kermit, Xmodem, Macbinary, Simxfer, Formac, Forsmpc, proprietary	300 to 19.2K	None	\$325
Softklone Distributing Corp. (904) 878-8564	Mirror III V1.0	Standard file transfer, terminal emulation software with file transfer	Software	Micro	Application	Any asynchronous ASCII device	Any that supports asynchronous or ASCII devices	256K	No	No	Both	Xmodem, Ymodem, Kermit, Crosstalk, Hayes, Compuserve-B	75K to 115.2K	None	\$99.95
Softronic, Inc. (800) 225-8590	Softerm PC	Terminal emulation with file transfer	Software	Micro, mainframe	Application	Data General AOS, AOS/VS, DEC VAX/VMS	AOS, AOS/VS, VMS	256K	Yes	Yes	Both	Asynch, TCP/IP, X.25, Declat	50K to 115.2K	None	\$195/micro, \$40/host
Software AG of North America (800) 843-9534	Natural Connection	Proprietary file transfer, terminal emulation with file transfer, distributed application communication, LAN gateway	Software	Micro, mainframe	System software	IBM, DEC VAX	MVS, DOS, CMS, CICS, TSO, CMS, Adabas	2K to 198K	Yes	No	Both	Asynch, BS2, CXI, Ficon, Fort, Irma, Icot Pathway	Any	None	\$700/micro
Software Business Applications (312) 863-4020	VSPC 928	Proprietary file transfer	Software	Micro, mini	Application	Wang VS	Wang VS O/S	8K	Yes	No	Both	Proprietary	1M	Terminal emulation board	\$100/micro
	VS PC 2110	Terminal emulation with file transfer	Software	Micro, mini	Application	Wang VS	Wang VS O/S	39K	Yes	No	Both	Xmodem, Xmodem-CRC, Ymodem, proprietary	19.2K	Wang VS, asynchronous connection	\$150/micro
Software Corp. of America (203) 359-2773	Gateway PC	Proprietary file transfer, terminal emulation with file transfer, distributed application communication	Software	Micro, mainframe	Application	Any mainframe	VM/CMS, MVS/TSO, CICS, any supporting Xmodem or Kermit	380K	Yes	No	Both	TTY, Irma, API, HLLAPI, X.PC, X.25	Any	None	\$9,000/CPU

MICRO-TO-HOST LINKS
PRODUCT SPOTLIGHT

COMPANY	PRODUCT	CATEGORY DESCRIPTION	SOFTWARE OR SOFTWARE AND HARDWARE	RESIDES ON WHAT PLATFORM	RUNS AS APPLICATION, SYSTEM SOFTWARE OR SYSTEM UTILITY	HOST HARDWARE	HOST ENVIRONMENTS	MICROCOMPUTER MEMORY REQUIRED	DATA FORMATTING	VIRTUAL DISK CREATION	MENU OR COMMAND DRIVEN	TRANSMISSION PROTOCOLS SUPPORTED	TRANSMISSION SPEED	ADDITIONAL HARDWARE OR SOFTWARE SUPPORTED	PRICE
Spectrum Concepts, Inc. (212) 766-4400	XCOM 6.2	Standard file transfer	Software	Micro, mini, mainframe	All	IBM running MVS, PCMs, System/36, 38, AS/400, DEC VAX, AT&T 3B2	MVS, VM, OS/400, CPF, SSP, VMS, Unix	85K to 200K	Yes	No	Both	APPC/LU6.2	Hardware dependent	None	\$475/micro
Sterling Software, Answer Systems Division (818) 716-1616	Answer-Link	Proprietary link	Software	Micro, mainframe	Application	IBM System 370, 4300, 3030, 3080, 3090	OS/VS, DOS/VSE, VM/CMS, IMS/DC, CICS/MVS, CICS/VSE, MS-DOS	384K	No	Yes	Both	IBM 3278, 3074 emulation	Up to 5.6K	None	\$9,800 to \$60,000
	Answer/ Ease	Proprietary link	Software	Micro, mainframe	Application	IBM 370, 4300, 3030, 3080, 3090	Same as above	640K	Yes	No	Both	IBM 3278, 3174, 3274, 3774, 3874 emulation	Up to 5.6K	None	\$10,200 to \$50,000
	VAXlink	Proprietary file transfer	Software	Micro, mini, mainframe	Application	IBM 370, 4300, 3030, 3080, 3090 or PCM link to Microvax through VAX 8800	Same as above	384K	Yes	No	Both	IBM 3278, 3174, 3274, 3774, 3874 emulation	Up to 5.6K	None	\$12,000 to \$56,200 (IBM), \$5,355 to \$42,394 (DEC)
	Micro/ Answer II	Proprietary file transfer	Software	Micro, mainframe	Application	IBM 370, 4300, 3030, 3080, 3090	Same as above	384K	Yes	No	Both	IBM 3278, 3174, 3274, 3774, 3874 emulation	Up to 5.6K	None	\$12,000 to \$56,250/ mainframe, \$715/micro
Sterling Software, Dylakor Division (818) 718-8877	Dyl-Vlink	Distributed application communication	Software	Micro, mainframe	Application	IBM 3030, 3080, 3090, 4300, 9370	MVS, DOS/VSE, VM/SP, VM/XA, TSO, CICS, IMS/DB/ DC, CMS	50K	Yes	Yes	Both	Async, IBM 3270, 3101	2K to 300K	Protocol converter, asynch board, terminal emulation board	\$9,800 to \$65,000
Structured Software Solutions (214) 985-9901	Facet/PC	Terminal emulation with file transfer	Software	Micro, mainframe	Application	Any running Unix System V	Unix System V	200K	Yes	No	Menu	Xmodem	300 to 38.4K	None	\$250 (DOS), \$100 (Unix, Xenix)
Syntax Systems, Inc. (206) 883-2525	SMBserver	Standard file transfer, distributed application communication, LAN gateway	Software	Mini	Application, system software	Arix, AT&T, Harris MCX, Honeywell XPS100, BIM ART, Masscomp, Sun-3, Unisys 5030/5050/-5085/5095, DEC VAX/VMS, VAX Ultrix	Excelan, Unix, VMS	NA	Yes	NP	Both	TCP/IP, XNS	10M	Netbios LAN software	\$115/micro; \$3,250/host
Systematics, Inc. (501) 223-5100	SIMS	Proprietary file transfer	Software	Micro, mainframe	System utility	IBM 4300	MVS, VSE, VM, CICS	640K	Yes	Yes	Menu	Irma, IBM 3278/79, SNA, Asynch	Varies	None	NP
The Systems Center, Inc. (214) 550-0318	Network Datamover	Proprietary file transfer	Software	Micro, mini, mainframe	System software	IBM 9370, 4300, 3030, 3080, 3090 or PCM	MVS, VM, VSE, Guardian	310K	Yes	No	Both	LU0, LU2	Hardware dependent	None	\$400/micro
Systems Interface, Inc. (613) 230-4103	Transactor	NP	Software	Micro, mini	Application	IIP 9000, Honeywell XPS, Unix minis, Motorola S8000	Unix	640K	No	Yes	Both	RS-232, TCP/IP, X.25	19.2K (up to 10M on LAN)	Microsoft Windows or New Wave	\$395/micro
Systems Strategies, Inc. (212) 279-8400	EZlink	Standard file transfer	Software	Mini	Application	DEC VAX, IBM S/38, AS/400	VMS, CPF, OS/400	NA	Yes	No	Both	Bisynch	56K	Synch communications interface, Bisynch port	\$12,000 to \$20,000
	BSClink/RJE	Standard file transfer	Software	Micro, mainframe	System utility	IBM 370	JES2, JES3, Power, RSCS	NA	Yes	No	Both	BSC2	9.6K	Synch communications board	\$2,000 to \$5,000
	SNAlink/RJE	Standard file transfer	Software	Mainframe	System utility	IBM 370	JES2, JES3, Power, RSCS	NA	Yes	No	Both	SNA/SDLC	56K	Synch communications board	\$2,000 to \$5,000
Tangram Systems Corp. (919) 481-4444	Arbiter	Proprietary file transfer, terminal emulation with file transfer	Software	Micro, mainframe	All	IBM mainframe running MVS, MVS/XA, VM	VTAM	70K	Yes	Yes	Both	LU1, LU2, LU6.2	Hardware dependent	None	\$15,000 to \$60,000
T.D.T Group (305) 372-9332	Transfile	Standard file transfer	Software, hardware	Micro	Application, system utility	Any with IBM 3780/2780 protocol	NP	110K	No	No	Both	3780, 2780	300 to 19.2K	None	\$499
Technology Concepts, Inc. (508) 443-7311 Ext. 221	Community DOS/Community Mac	Terminal emulation with file transfer	Software, hardware	Micro	Application	DEC VAX, Unix or proprietary system running Community	VMS, Ultrix, Unix, proprietary, DOS	DOS, to 158K; Mac, 150K to 700K	Yes	Yes	Command	Decnet	10M over Ethernet	Decnet, Ethernet controllers	Starts at \$350
3Com Corp. (408) 562-6400	Maxess SNA Gateway	Standard file transfer	Software, hardware	Micro	System utility	IBM 370	CICS, MV/SP, MVS/TSO	200K	Yes	No	Both	SNA	64K	Gateway co-processor	\$4,995/LAN
Touchstone Software Corp. (213) 598-7746	PCworks	Standard and proprietary file transfer, terminal emulation with file transfer, distributed application communication, LAN Gateway	Software	Micro	Application	AT&T 3B, DEC PDP-11s, VAX, HP 9000, IBM RT, 3031, Masscomp 500, NCR Tower, Sun-2/3, Unisys 5000/6000/7000 (abbreviated list)	Xenix, Unix, VMS	256K	Yes	No	Menu	ASCII, Dmodem, proprietary	19.2K	None	\$195 to \$249
	Unihost	Proprietary file transfer	Software	Micro, mainframe	Application	Same as above	Unix, Xenix, VMS	Up to 100K	Yes	No	Command	Proprietary	19.2K	None	\$395 to \$1,295
	MacLine	Standard and proprietary file transfer, terminal emulation with file transfer, distributed application communication, LAN gateway	Software	Micro	Application	Same as above	Unix, Xenix, VMS	512K	Yes	No	Menu	ASCII, Xmodem, proprietary	19.2K	None	\$145
Trisystems Corp. (603) 883-0558	TCLINK 3270	Standard and proprietary file transfer, terminal emulation with file transfer, distributed application communication, LAN gateway	Software, hardware	Micro, mainframe	Application	DEC VAX, IBM 4300, 8100, S/36, 38, AS/400, HP	TSO, CICS, VM, ADCS, SSP, OS	60K to 256K	Yes	No	Both	BSC, SNA, Token-Ring	82K to 19.2K	None	\$600 to \$975
Ungermann-Bass (408) 496-0111	Net/One MV-DHS	Terminal emulation with file transfer	Software, hardware	Mini	System utility	DEC VAX	VMS	649K	No	Yes	Menu	XNS	19.2K	None	\$1,000 and up/host
	MIV-74	LAN gateway	Software, hardware	NA (box level interface)	System utility	NP	NP	150K	No	No	Both	SDLC, BSC	19.2K	None	\$4,825

COMPANY	PRODUCT	CATEGORY DESCRIPTION	SOFTWARE OR SOFTWARE AND HARDWARE	RESIDES ON WHAT PLATFORM	RUNS AS APPLICATION, SYSTEM SOFTWARE OR SYSTEM UTILITY	HOST HARDWARE	HOST ENVIRONMENTS	MICROCOMPUTER MEMORY REQUIRED	DATA FORMATTING	VIRTUAL DISK CREATION	MENU OR COMMAND DRIVEN	TRANSMISSION PROTOCOLS SUPPORTED	TRANSMISSION SPEED	ADDITIONAL HARDWARE OR SOFTWARE SUPPORTED	PRICE
Unipress Software, Inc. (201) 985-8000	PC Works	Terminal emulation with file transfer	Software	Micro	Application	Arete 800, 900, 1100, 1200, AT&T 3B2, 6300, 7300, 6386, DEC VAX, Microvax, Unisys 5000, 7000	Unix	128K	Yes	No	Both	Sequenced packets	Sequenced packets	None	\$195
Unisys Corp. (313) 972-7000	Comm M10 Poll Select File Transfer Utility	Proprietary file transfer	Software	Micro, mainframe	System utility	Unisys A and V	Unisys A and V series operating system	512K	No	Yes	Both	Proprietary	2.4K	None	\$595/micro
	Infoview II Release 3.2	Proprietary file transfer	Software	Micro, mainframe	System utility	Unisys A and V	Unisys A and V series operating system	512K	No	No	Menu	Proprietary	2.4K	None	\$301
	Data Transfer System	Proprietary file transfer	Software	Micro, mainframe	System utility	Unisys A	Unisys A series operating system	128K	Yes	Yes	Menu	Proprietary	2.4K	None	\$770/micro
	Oltrah-PC-On-Line-Transfer	Proprietary file transfer	Software	Micro, mainframe	System utility	Unisys A and V, 1100	Unisys A and V series operating system	256K	No	No	Command	Proprietary	2.4K	Terminal emulation package, Step board	\$2,310/host
Universal Software, Inc. (203) 792-5100	Universal-Link	Standard file transfer	Software	Micro, mainframe	System software	IBM 4300, 9370, 3030, 3080, 3090	MVS, DOS/VSE, Xenix, Unix	128K	Yes	No	Both	3780 Bisynch/Asynch	110 to 9.2K	None	\$600/micro, from \$8,000/host
Virtual Microsystems, Inc. (415) 573-9596	V-Drive	Terminal emulation with file transfer	Software	Micro, mini	Application	DEC VAX, Microvax, Vaxstations	VMS/MS-DOS	85K	Yes	Yes	Both	ASCII, Binary	1200 to 19.2K	None	\$100 to \$1,000
Walker Richer & Quinn (206) 324-0350	Reflection 1	Proprietary file transfer, file transfer, terminal emulation with file transfer	Software	Micro, mini	Application	HP 3000, 9000, 1000	MPE, HP/UX	152K	No	No	Both	Kermit, Xmodem, Proprietary	1.2K to 115.6K	None	\$299/micro
	Reflection 2	Standard and proprietary file transfer, terminal emulation with file transfer	Software	Micro, mini	Application	DEC VAX	VMS, Unix	151K	No	No	Both	Proprietary, Xmodem, Kermit	1.2K to 115.2K	None	\$199/micro
	3270 File Fxchange	Standard file transfer, terminal emulation with file transfer	Software	Micro	System utility	IBM with IND\$FILE	MVS/TSO, VM/CMS	10K	Yes	No	Command	X.25	Hardware dependent	Protocol converter	\$99/micro
Winterhalter, Inc. (313) 662-2002	Datatalker 3270	Standard file transfer	Software, hardware	Micro, mini, mainframe	System utility	Any IBM mainframe running IND\$FILE utility	TSO, CICS, CMS, Unix, Xenix	128K	No	No	Both	SNA, BSC	19.2K	None	\$895 to \$1,595/micro

Atlantic Steel

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each multiuser 386 system is around \$12,000. After that, Ward says, the incremental cost is \$450 per user, the cost of a Wyse Technology 60 terminal.

This is possible, in part, because the data and programs are stored in virtual diskettes on the mainframe and accessed through the network.

"Multiuser 386 systems would not be feasible without our micro-to-mainframe technology," Ward adds. "A user at a dumb terminal attached to a 386 has the same ability to retrieve, process and store data as if he had a stand-alone system."

Five for now

The company currently supports as many as five simultaneous users on one 386 system. The users are connected to the 386 system via intelligent eight-port, RS-232-C-compatible serial boards, manufactured by Maxpeed Corp. in Foster City, Calif. At least in theory, three Maxpeed boards can be installed on each 386 host for a total of 25 users per host.

"Based on our results," Ward reports, "we anticipate no difficulty in expanding to 10 users. A 10-user 386 system costs less than \$20,000. That's \$40,000 less than 10 PC AT-class machines. Yet our users report that response times are about the same as stand-alone AT-class machines and much faster than the PC XT-class machines many of them have been using."

Eventually, Ward says, this outgrowth of Atlantic Steel's initial decision to employ micro-to-mainframe link technology could save the company as much as "hundreds of thousands of dollars." •

A guide to micro-to-host terms

Advanced Program-to-Program Communications (APPC): A set of protocols designed by IBM that enables application programs to interact directly with each other on a peer-to-peer basis, even when the programs are on separate and remote processors.

Distributed Data Management (DDM): An IBM application that supports remote file access across a Systems Network Architecture (SNA) network.

Extended Binary-Coded Decimal Interchange Code (EBCDIC): An 8-bit data transmission code developed by IBM and used primarily for synchronous communications in IBM mainframe and compatible systems.

File transfer: Movement of a complete set of data from one computer to another, usually accomplished by dividing a file into a series of screens that are then reassembled at the receiving end.

Gateway: A device that uses protocol conversion to connect dissimilar communications systems. The gateway provides the translation from one set of protocols to another.

High-Level Data Link Control

Information provided by Digital Consulting, Inc., an Andover, Mass.-based consulting firm.

(HDLC): A data communications protocol developed by the International Standards Organization (ISO) and later incorporated into the link layer of its Open Systems Interconnect model.

Link: A circuit or transmission path, including all equipment between a sender and a receiver on a network.

Link layer: Layer 2 of the ISO Reference Model for OSI. At Layer 2, ISO has established standards and protocols for managing the physical transfer of data between nodes.

Logical Unit (LU): The port, or network-addressable entity, through which users gain access to SNA and communicate with one another.

LU6.2: An IBM protocol for the peer-to-peer communication of devices on an SNA network.

Micro-mainframe link: A package specifically designed to accomplish file transfer or application integration between a PC and a mainframe computer.

Physical Unit 2.1 (PU2.1): An IBM protocol that facilitates cooperative processing by supporting multiple "conversations" within a single session.

Protocol conversion: The process of

translating protocols from one computer system to another so that the two different systems can communicate.

Session: A series of conversations or interactions that take place between two application programs.

Synchronous transmission: A transmission scheme whereby data is sent as blocks of characters with controls at the beginning and end of each block that ensure constant timing or synchronization.

Synchronous Data Link Control (SDLC): An IBM synchronous communications protocol that operates with SNA.

SNA: A proprietary plan, developed by IBM, for the design of a wide-area network and supported by almost every computer vendor. SNA is a de facto standard that includes APPC.

Terminal emulation: A method of data transfer whereby a PC, via use of an IBM 3270 emulator board in the PC or by protocol conversion, imitates the characteristics of a dumb terminal so that it can receive data from the mainframe.

Virtual disk: A disk that appears to belong to one user but in fact is shared or available to all users on a network.

IBM repository on its way

MIS can lay groundwork today for upcoming data dictionary replacement

BY DAN TASKER

It's no big secret that IBM is working on a repository product to replace its aging data dictionary offering. While conjecture as to its release date varies, what is clear is that it will be of primary use to medium-size and large MIS installations that are having difficulty managing the thousands of hardware and software components of their complex information systems.

A big problem today in almost all large data processing installations, and in many smaller ones, is that the left hand does not know what the right hand is doing. The level of communication and coordination between development groups, or between development groups and operations, is anything but satisfactory.

Thus, the principal benefit of the repository product will be as a basis for integrated solutions, or tools, used in the efficient development and operation of information systems. And while the product is not yet available — nor even officially announced — there is a great deal of groundwork that MIS can lay today.

These efforts will enable a shop both to migrate to this new environment more quickly and to achieve significant benefits along the way.

There are five fundamental steps MIS can take to achieve a repository-based integrated tool set that will provide automated support for managing, developing and operating information systems.

• **Step 1.** Understand the management and personnel prob-

lems that might somehow inhibit effective implementation.

• **Step 2.** Establish an overall plan at organizational, functional and data levels.

• **Step 3.** Gather data requirements.

• **Step 4.** Design integrated solutions.

• **Step 5.** Implement integrated data and tools.

Of these five steps, only the very last is fully dependent on the actual availability of a functioning repository product. Examination of each of these steps in turn can show how an MIS organization can begin today to prepare for an integrated repository product.

Understand the problems

It is not enough that one person, or even one group within an installation, recognize and understand the need for and benefits of a repository. The entire MIS department must realize that an integrated tool set is one that captures data once and uses it many times. Otherwise, the group will not know how to implement it properly.

One benefit of the integration that can be achieved with a repository is reduced tool development effort. Only one set of data-sourcing logic is needed, with no bridging or interfacing required. Another benefit is increased integrity of MIS data. Having a single source of update means there is no chance of multiple data sources getting out of sync. A third benefit is greatly improved

management information based on a common, well-defined set of objects or entity types that are uniformly reported and understood. Additional benefits include reduced training costs and increased management control.

Ironically, one of the roadblocks to establishing the integrated solutions that can come with a repository is today's application developers.

These highly trained individuals have, over time, established their own ways of working their magic. These people earn their living providing automation that changes other people's lives, yet they themselves are often very set in their ways, which makes for an interesting contradiction.

A second, related obstacle is that operations personnel, over time, have acquired or developed far too many individual pieces of automated support that allow them to manage their day-to-day responsibilities.

One bank in Seattle identified 37 different "systems," each involved in maintaining some aspect of its network. The operations staff, which has a great responsibility in terms of keeping critical production systems running, is not anxious to let go of these lifelines.

It is no easy task to convince

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- Know who does what in your shop
- There's nothing magic about data models
- A tool to build tools

operations and development people to change their current ways and embrace concepts that they are not comfortable with, such as "repository" and "integrated solutions."

Another very real problem is that all of these people are likely to be working flat out just trying to meet their existing commitments, with little or no time to scale another learning curve.

The repository concept must be sold to the company's top-level management. The bigger the installation, the more examples there are likely to be of redundant data, multiple tools supporting the same activities and so on. An MIS commitment to moving toward an integrated tool set is essential, both in providing near-term resources and long-term migration efforts.

Establish an overall plan

The overall objective behind a repository is to establish an integrated tool set for MIS that operates on integrated data. The repository is intended to hold data about development and operational components such as programs, files and network devices. This data, in turn, is manipulated by the tools, which were designed to support one or more of the activities performed by MIS personnel.

In order to define tool requirements, an MIS installation must have a clear understanding of what activities it performs and who performs them. The chart at right illustrates the relationships among the four vital tool set: people, activities, tools and data. An MIS installation must have accurate, maintainable data for each of these elements to successfully establish a repository and a comprehensive set of integrated tools.

By starting with high-level models of organization, function and data, MIS can establish a plan to complete lower level details.

At this stage, there is likely to be another gap in understanding by MIS staff that must be bridged. Many of those who need to be involved in both planning for and contributing to overall information-gathering exercises may not be well versed in aspects of data modeling.

Organization, function and data actually represent three different perspectives of MIS. The most universally understood model is the organizational chart, which contains information about who makes up the MIS organization and defines the reporting relationships.

These kinds of models are often maintained in a distributed fashion, with each subgroup looking after its own lower level reporting structure. But even with all the technology available today, it is still surprising how many enterprises do not maintain even the higher levels of

available information in some form of database.

Most organizational charts are updated and produced either manually or on a word processor. Accurate data about people — for example, data on project staffing, sign-off authority, problem resolution responsibility and so on — will eventually be necessary within the repository.

Therefore, such data should be implemented in some form of maintainable database now. This organizational information will have immediate use in the MIS group's relationships and eventually can be migrated into the repository itself.

Organizational models may be easy to pin down, but few companies, if any, maintain a functional model of themselves. Because organizational units tend to have meaningful names such as Customer Service, Marketing & Sales and Accounting,

organizational charts provide somewhat of a functional perspective.

It is not unusual, however, for multiple organizational units — regional sales divisions, bank branches, multiple factories and so on — to perform similar functions such as selling, servicing or manufacturing. This means that functions within an organizational model can be redundant. What is lacking, therefore, is a normalized or nonredundant set of well-defined functions that are important to operating the business.

Functional modeling techniques such as decomposition and data flow diagrams have proven useful in the development of information systems. Individual functions or activities are named, defined and shown in relationship to other functions. The highest level defined for such models often begins at the point appropriate to the individ-

ual application being addressed.

In reality, each of these applications is a part of the overall set of functions for an enterprise. Just as the complete organizational chart begins at the highest level, a functional model of an enterprise should start at the highest level. The first few levels then act as a framework within which individual applications can be defined.

Who does what

The task at hand, however, is to establish integrated MIS data and function. Even on this smaller scale, it is possible to have several groups performing similar functions. It therefore makes equal sense to establish a functional model for all of MIS. Once defined, these nonredundant functions are used for cross-referencing to the MIS organization. Establishing this link can make possible on-line access showing who does what.

Creating models of the MIS organization and MIS function is an important prerequisite to later steps. It is equally important that procedures are put in place to ensure that these models are updated over time. Again, the culture of an organization guarantees that organizational charts are updated and published following any significant changes. But what of the links established to functions?

Those responsible for planning any kind of reorganization should be aware of the impact such changes have on accomplishing the work. Similarly, when changes in methodologies or technologies affect what activities MIS performs, it is im-

portant that people within the organization be assigned responsibility for performing them or be informed that they can cease carrying out an obsolete activity.

At Westpac Banking Corp. in Sydney, Australia — where repository planning forms the basis of the five preparatory steps — the individual functions performed by MIS staff are recorded as a part of the annual personnel planning/performance evaluation procedure. Originally, each individual was responsible for describing the activities in which they were expected to be effective.

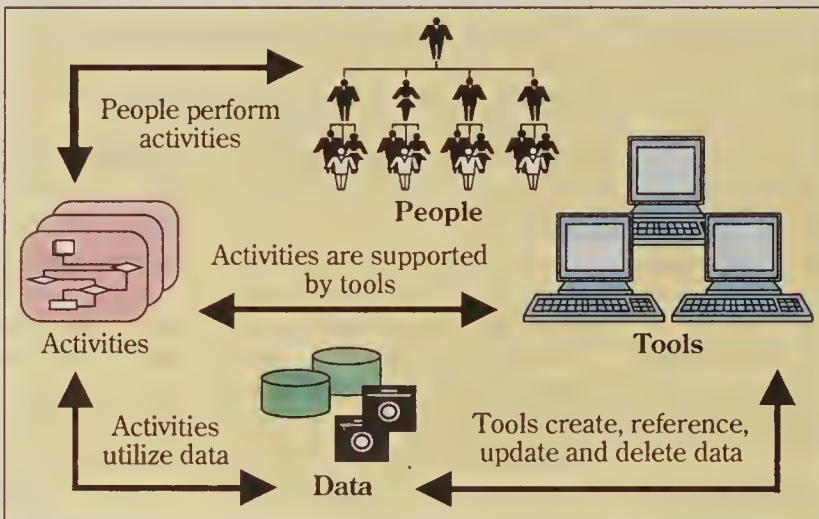
By defining an MIS functional model, a normalized set of these activities was established that could then be used as part of this process.

Again, there is immediate benefit even prior to a repository in that more rigorous data can be provided to management. One obvious use is for controlling functional overlaps and underlaps. At the same time, it establishes a mechanism that ensures that the functional model, and its cross-reference to the organizational model, will be maintained.

Once a nonredundant functional model is in place, it also provides a basis for mapping current automated support tools — for example, compilers, test data generators, direct-access storage device management and so on — within the organization. Again, this is useful for identifying overlaps and underlaps. This cross-reference can also be established using existing storage technologies. In addition, it represents another valuable step in bringing order out of the chaos

The four elements of an integrated tool set

In order to define IBM repository requirements, MIS must have a clear understanding of the relationships among the four elements



CW CHART: DOREEN DAHLE

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that exists today in many large installations regarding the coordination of tool evaluation and acquisition.

Gather requirements

The basis for true functional integration and the tools that facilitate it is a common, shared set of data. Traditional application, or tool, development involves defining the particular data requirements and implementing them in a manner designed to support that individual need.

Data-modeling techniques and the principles of normalization provide methods for designing and implementing data that is not optimized for any one function but is usable by any number of functions that might require it. This eliminates the additional effort involved in resourcing or reformatting data, which is so often necessary with today's unintegrated tools. Interestingly, those people assigned to the building of bridges between today's tools are the ones crying the loudest for an integrated repository.

Each MIS activity supported by a tool within the repository will still have its own particular data requirements. These requirements, however, should be seen as views or subsets of the entities and relationships in the overall design model. What MIS must guard against is the *implementation* of particular data requirements without regard to the larger scope.

The functional model provides a basis for establishing what data models, or views, need to be defined. No entity should appear in the overall repository

model that is not based on some activity view.

As activities change over time, so will their data requirements. This again emphasizes the importance of maintaining a current MIS functional model. Activity data-model views act as the cross-reference between data and function.

Establishing data model requirements represents another opportunity for MIS installations to gear up for a repository. IBM's stated direction clearly indicates that its repository product will be based on an entity/relationship model. Because data modeling is a much newer discipline than either functional or organizational modeling, it is the least understood by MIS managers and staff.

But there is nothing magic about data models. Like anything else, it is a matter of education and familiarity. Introducing these concepts to the MIS community will now help overcome one additional learning curve facing the utilization of the new repository.

For instance, any installation that does not currently employ skilled data analysts would do well to train or acquire some. People with these skills are essential to both the requirements and design steps of the process being described here.

Data modelers and data ana-

lysts are a rare commodity today. As more installations realize their importance in establishing an integrated repository tool set, they will be at a premium.

The importance of gathering requirements for individual MIS activities is based on the fact that the repository product itself will not consist of a single, all-encompassing set of functionality to support all MIS activities. Its primary purpose should be to act as a storage manager for the data. The only functions the repository should be expected to perform are those that can be ap-

plied to any data stored there.

The ability to query and/or report on any item stored within a repository is one example of such a data-management function. In contrast, functions such as generating IMS control blocks or Cobol I/O areas apply to very specific kinds of repository-based data, like segment definitions.

The repository tool, as described by IBM, is intended to be a tool to build tools. Software products capable of generating control blocks should be thought of as tools that specifically sup-

port a database administration activity. Only installations that use IMS would be interested in this particular functionality and would require it as part of their integrated tool set. Similarly, an MIS shop that strictly uses a fourth-generation language would not require — nor would it wish to pay for — a tool that generated Cobol I/O copy library members.

The importance of defining MIS activity-based requirements is to facilitate the selection or creation of tools that will eventually make up an installation's integrated tool set. Some of these tools will be available from IBM. The company has also made it clear that its repository will be open for third-party vendors to supply add-in tools.

Indeed, a major advantage of the eventual existence of an IBM repository is that it will act as a focal-point product with which other tools can integrate. Many of the vendors of today's stand-alone tools will likely produce versions modified to integrate with the repository. When enough customers realize the benefits of integration, the market for stand-alone tools will likely be greatly reduced.

Further, because of the entity/relationship nature or direction of the IBM repository, all tools will of necessity include data models as part of their specifications. By defining the particular requirements of a given installation in terms of activity data models, there will exist a common basis for evaluation of add-in tools.

Design specifications

The repository tool itself should function primarily as a database management system. But without the proper administrative controls, it is susceptible to the implementation of nonintegrated data and functionality (see upper portion of chart above).

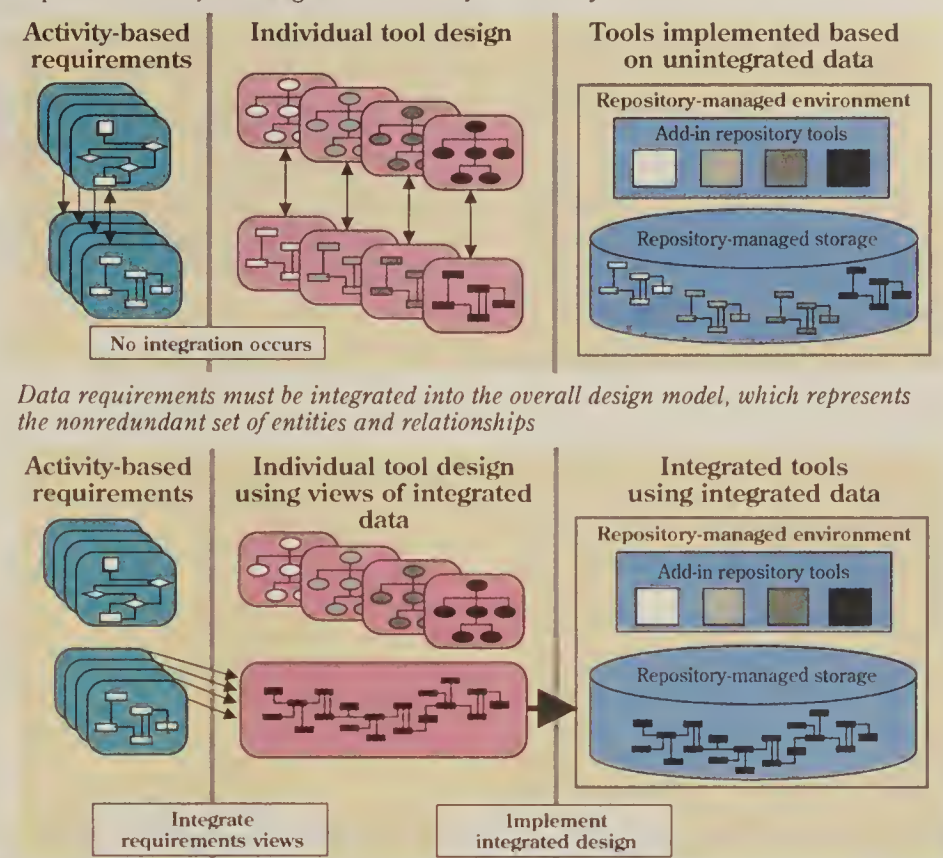
An important phase that follows requirements gathering is implementation-independent design. While the functional requirements go through a process that eventually produces code, the data requirements need to be merged, or integrated, into an overall design model (see lower portion of chart above). This represents the single, normalized, nonredundant set of entities and relationships.

The eventual implementation of this design model within some DBMSs — for example, the repository — will be subject to certain performance-related compromises such as selected denormalization, controlled redundancy and so on, based on the repository product's particular strengths and weaknesses.

The entity-merge step within the design phase is necessary for identifying what requirements can be satisfied by existing design entities. A person or group whose job it is to be familiar with

A repository design model

Without administrative controls, the IBM repository would be susceptible to implementation of nonintegrated data and functionality



CW CHART: DOREEN DAHLE

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the design model should be involved in performing the integration of these requirements. The reuse of previously established entities is the basis for integration and reusability of data.

Implementation

The fifth step must, of necessity, await the actual availability of a repository product. It would be feasible to implement the above

tools using any currently available DBMS. The ramification of such a decision, however, is that a homegrown repository would not provide the same degree of integration with tools eventually offered by both IBM and third-party vendors.

But in the short term, such a solution can offer certain functionality that is not presently available, as well as providing a

much cleaner, less redundant set of data than currently exists.

If the intent is to eventually migrate this data to the IBM repository, the extent of investment in throwaway code should be carefully weighed. If steps one through four have been followed in this effort, the transition should be greatly simplified because of the data that exists in normalized form.

Meanwhile, MIS itself needs to be organized and managed in such a way that its reporting structure and functions are clearly defined and maintained on some DBMS. Together, these two models become the basis for a cross-reference system defining who is responsible for what. This information is probably not well-defined today and almost certainly not kept or

maintained on-line. Establishing it now means that implementing integrated change-management and project-management tools will be greatly facilitated in the new repository.

In addition, an inventory of tools — linked to the activities that they support — should exist. In the near term, this inventory can be used to eliminate redundancy — both in cost of tools and in training in different systems that essentially accomplish the same thing.

The data created and/or manipulated by these tools begins to identify sources of information that will eventually be migrated into a repository. Gathering this information will be vital when it is time to cost-justify both the repository tool itself and add-in tools.

Because the new repository would not be accepted if it did not

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An integrated security management system that can monitor and display security and fire alarms will help security forces operate more efficiently. The system, designed by Hughes for General Motors' Regional Personnel Administration, will integrate new and existing systems in 180 GM plants throughout the United States. GM will establish 12 Regional Personnel Centers (RPCs) to serve the plant sites. Each RPC will perform central monitoring and control, rather than each plant site performing its own, as is presently the case. The new system has the potential to save GM millions of dollars each year. A similar Hughes-designed system is currently installed in the Smithsonian Institution in Washington, D.C.

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ANY MIS installation impatiently waiting for IBM to deliver a repository product that will magically solve all of its problems is a few bits short of a byte.

at least have tools available that matched the present level of automated support, a current inventory of tools acts as a priority list for either IBM or third-party vendors to provide integrated, repository-based versions of current products. It also clearly defines what migration plans must be developed for converting to integrated tools.

Also, MIS should create a single design data model that represents the sum total of all currently defined requirements of MIS activities. The design model will ensure that, as tools are added into the tool set, there will be maximum benefits from integration. The individual activity-view data models represent requirements that can be used when evaluating commercially available tools. The same requirements, both functional and data, can also serve the option of in-house development of any particular repository-based tool.

The data-modeling exercises act to sharpen the skills of data analysts while familiarizing managers and staff with both the concepts of data models and integrated repository solutions.

Bear in mind that any MIS installation impatiently waiting for IBM to deliver a repository product that will magically solve all of its problems is a few bits short of a byte. The integration that such a tool will make possible will necessitate both procedural and cultural changes within any MIS organization. Preparing and educating for these changes should begin immediately. •

TAKING CHARGE

Sally Brecht

Planning for the worst

When I assumed responsibility for the Educational Testing Service Information Systems & Technology (IS&T) division's disaster and application recovery planning, I was not particularly concerned about the effort required by the task. After all, disaster and application recovery planning are nothing new. Surely there was plenty of information on what a plan should address, right?

Wrong. So began my search for information critical to disaster and applications recovery. The following are some of the topics that managers should address in their plans. Remember, though, that organizational needs and culture drive recovery plans. Just as no two organizations are alike, no two plans are identical.

Happily, my predecessor addressed several major aspects of disaster recovery planning. A backup processing site was under contract and a rudimentary disaster recovery plan in place. A secure off-site storage vendor was under contract, and critical operating systems, programs and application-specific data were regularly rotated off-site.

My goal was a plan of minimal size and complexity that promoted IS&T's ability to move into a hot site within 24 hours of a disaster declaration. The plan is organized by the personnel who could be active partici-

Continued on page 97

Hands-on IS president maintains open door

BY ALAN J. RYAN
CW STAFF

When J. Raymond Caron steps out from behind his desk to shake hands with visitors, he does it with the same casual ease he might have stepping onto a green at his favorite golf course.

Caron, president of Cigna Systems, a division of Cigna Corp., is a people person. He has earned high grades from his co-workers because he has climbed the Cigna ranks from programmer/analyst 18 years ago to president today. Further, he has won their friendship because his interest in them is genuine, they say.

When one of his employees was dealing with an ill parent, Caron asked on a daily basis how things were going, says Kathy Taylor, vice-president of financial strategic planning and corporate support services.

"He is very personable," she says. "We both get in early at about 7:15 a.m. He'll pop in for a social chat to say, 'How was your evening?' or 'How was your weekend?' He tends to do that with most people."

At Philadelphia-based Cigna Systems, Caron, 44, runs the arm of the \$17 billion (reflecting 1987 revenue) insurance company Cigna, which is responsible for all systems development, data processing and telecommunications for the corporation worldwide.

Caron's promotion nearly a year ago followed a hectic two-year staff cutback period during which the staff size was reduced from 4,000 to 3,100 through attrition and some layoffs. Now the

company wants the employees to look forward, and Caron's interpersonal skills are perfect for the task.

"Ray is good at getting people to focus on the value they can bring to Cigna, rather than how awful it was when we did the downturn," says Jim Valenteen, senior vice-president of human resources at Cigna Systems. "He's one of them, and they recognize that when they see him."

Swinging door

In his 20th-floor office overlooking center-city Philadelphia, New England native Caron's open-door policy allows the influx of information he needs. "He can draw out of people ideas, suggestions and complaints," Valenteen says. "They know that he is not going to turn back a suggestion or complaint as not being well-thought-out. He lets them say their piece, and then he responds."

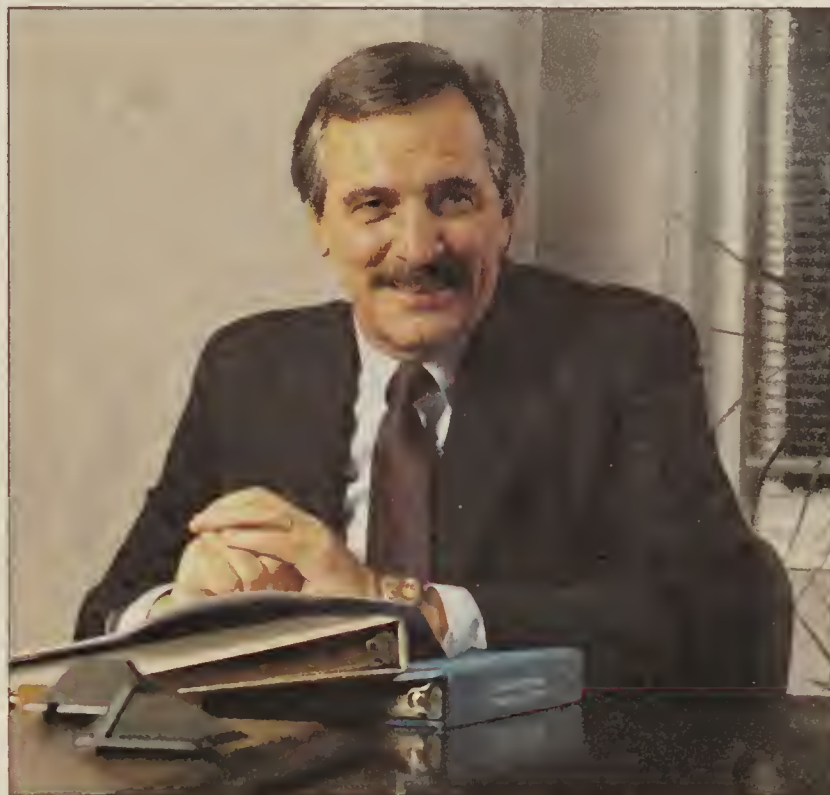
Caron's duties include overseeing 3,100 employees, a \$340 million annual budget and the computing operations of Cigna's four groups — Property and Casualty, Employee Life and Health Benefits, Employee Retirement and Savings Benefits and Individual Financial Services — as well as 16 divisions within those groups.

Caron is responsible for creating the link between the business strategies and the technology and ensuring that the systems that are developed are being used to achieve maximum benefit.

He admits that because he has held many of the positions that are now filled by people who re-

PROFILE

J. Raymond Caron



Position: President, Cigna Systems

Mission: To create the link between business strategy and technology for Cigna Corp.'s four insurance and financial services units

port to him, "there has been a propensity on my part to have a hands-on type approach." Caron talks fondly of his time spent working on the team that developed the Electronic Insurance System for Cigna, an on-line, integrated policy accounting and writing claims-receivable application that is still the backbone of the company's property and casualty operation.

Go, team, go

Caron still enjoys the team feeling today. During a recent tour of Cigna's data center training facilities in Hartford, Conn., Caron introduced himself to an entry-level employee who was working on a flowchart. When she asked if he would like to help, Caron pulled up a chair and worked with her for 30 minutes,

Valenteen recalls.

Sometimes Caron's hands-on approach may work to his disadvantage, though, Valenteen says. "He's got to get up beyond the day-to-day problem solving, but he reverts to his old haunts because that is where he built his reputation," he says.

However, Caron says that he is evolving to the point at which he relies on his direct staff, try-

Continued on page 94

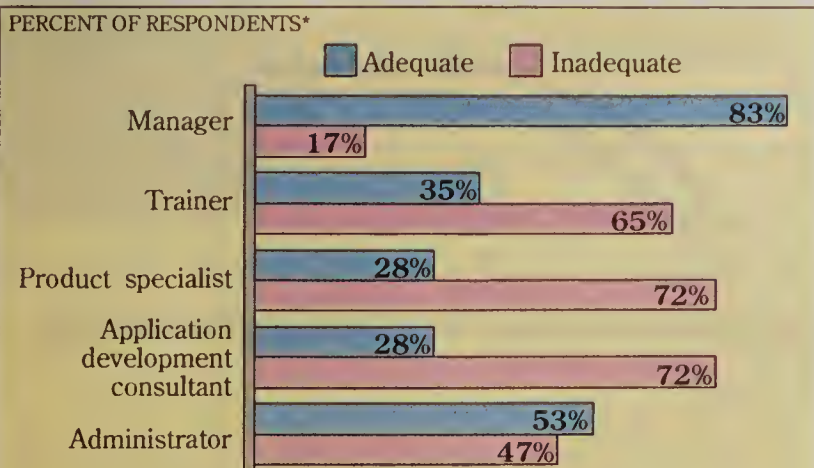
Inside

- Dudley Cooke leaves Sun to form own firm. Page 93.
- IS as a balance-sheet asset. Page 94.
- National CASE Conference scheduled for June. Page 96.

Data View

Understaffed

Inadequate staffing is felt in several information center-related positions



*Base of 475 professionals involved with end-user computing

SOURCE: CRWTH COMPUTER COURSEWARES
CW CHART: FRANK C. O'CONNELL

Ups and downs of MIS stardom

BY ALAN J. RYAN
CW STAFF

Having a well-known name in the information systems field is not synonymous with respect or success, nor does it necessarily make a manager more marketable.

Still, some IS managers who qualify as celebrities among their peers say there are many benefits.

Being recognized as a leader in any field is an accomplishment, one manager said. The four professionals polled by *Computerworld* said attaining

success brings about a sense of self-worth. All agreed that speaking publicly about their jobs and the success of their IS strategies is good for their companies.

Proud company

"It gives my organization a sense of pride to feel that they are part of an organization that is successfully implementing information technology," said John W. White, vice-president of information systems and services at Texas Instruments, Inc. in Plano, Texas.

How does it feel to be well-

known? "We tend to work in isolation" in this field, said Ronald Brzezinski, vice-president of information systems at The Quaker Oats Co. in Chicago. "The nice part is you get recognized for something that you enjoy doing. But the worst thing to do about it is to feel cocky."

Brzezinski said that at times, being well-known can cause pressure from peers within the company. "If someone does pop up more often in the press, it can cause some type of minor short-term alienation. That is very real," he said.

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MIS stardom

CONTINUED FROM PAGE 91

Unlike star figures in other fields, most data processing celebrities do not set out on a planned path for fame and fortune. "You don't want to work on that happening," Brzezinski said. "If anybody worked on trying to do that, it would look artificial."

Being successful and holding a high profile certainly means more than being everywhere and doing everything, said Dudley P. Cooke, president of Bryn Mawr, Pa.-based The Executive Insight Group, Inc., (see story page 93) and former general manager of Sun Co.'s information systems division.

"I always wanted to feel I was getting value for my company in what I was doing," Cooke said. "I know people that join everything but never get their job done."

Public speaking, one of the tickets to a



Texas Instruments' White

high profile, involves more than just landing the engagement. To be successful at it, the speaker should also be somewhat of a ham, enjoy the recognition, enjoy making presentations, have a desire to teach others and, perhaps most important, believe in his or her views strongly enough to want to communicate them to others.

Getting speaking assignments is not difficult, said Elaine Bond, senior vice-president of the corporate systems group at The Chase Manhattan Bank NA in New York.

"At first, you volunteer, and after a time, you get invited to speak," Bond said. Next, she said, calls start coming in from people who know others who have heard you speak. Good tickets to getting the initial assignments include memberships and offices held in professional groups and societies as well as customer advisory councils.

Role model

It is important to use the time allotted for outside work wisely, Bond added. Sheer size of the group or conference is not always important. Bond said she believes in devoting some of her time speaking to student groups. A benefit to speaking is being able to be a role model to others, she said, which is important in an industry that employs many women but has few in senior positions.

TI's White said that the effort necessary to create a speech is time well-spent. He rarely talks on issues that are not closely aligned with his company's strategic direction, so most of the speeches can be used both internally and externally.

At times, popular speakers can be-

come overtaxed. "The outside world will take up 100% of your time, if you allow it," Cooke said.

Successful speakers also need to know how to say no, those interviewed said. Speakers are wise to carefully consider not only the timing of speaking engagements but the topic as well.

"You run a significant risk that while 85% of the audience may be new to the topic, you've got that 15% who is going to be bored and burned out with having heard you say

that once. That is a real concern I have," TI's White said.

Other ways that well-known IS experts have attained that status include



Chase Manhattan's Bond

contributing articles or columns to trade publications or speaking with the press on various issues. Cooke said he always returns every phone call he receives.

"But caution must be used there as well to avoid the feeling of 'there he goes, blowing smoke again' from industry people," Brzezinski said. "You have

to be careful when you comment that you're not just professing something everybody else knows."

Surprisingly, those interviewed said being highly visible was not necessarily a ticket to success, nor does it make an employee more marketable to other companies. "Being vocal about what you do and where you work does imply satisfaction and strong feelings" about one's company, Brzezinski said, which naturally repels the job-placement headhunters.

However, Cooke believes that his visibility in the corporate world will help him in his latest career switch. "That is one of the reasons I retired from Sun," he said. "I have a reputation, and it is easier" to build a new career from that starting point.

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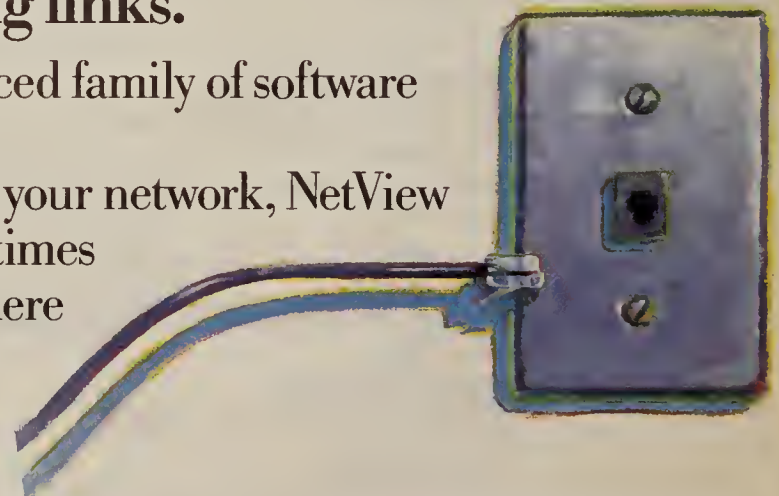
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MANAGERS ON THE MOVE

Sun Co.'s Cooke retires, starts firm

BY ALAN J. RYAN
CW STAFF

The former general manager of Sun Co.'s information systems division, **Dudley P. Cooke**, has launched a firm that will advise senior business executives on dealing with issues and opportunities related to IS management.

Cooke, a frequent speaker on MIS issues and a 26-year veteran of Sun, started the firm, **The Executive Insight Group, Inc.**, in Bryn Mawr, Pa.

While at Sun, Cooke began in the com-

pany's financial organization and then moved to materials management. Later, he was promoted to head the company's marketing and manufacturing financial organization of 2,000 people. He moved into corporate administrative activities and headed up the Sun Data group, previously known as Sun Information Services.

"Most often in large corporations, you have an embedded organizational base, and you don't have the chance of the senior people saying, 'Go ahead and do it,'" Cooke said. With the Information Services group, Cooke was able to handpick

his own workers and organize the operation. He stayed at that job for six years.

In his new career, Cooke said his biggest challenges include marketing the business and maintaining a calendar that is neither too full nor too empty. "I've got four good clients now, and if they all call and want me the same week, I'm in trouble," he said.

Prior to Sun, Cooke spent seven years with Exxon Corp. in various engineering posts. He has been an active member of the board of sponsors of the Center for Information Systems Research at MIT and



Executive Insight's Cooke

currently maintains a seat as a member of the executive committee of the Society for Information Management. Cooke is a graduate of the University of Rhode Island, with a degree in engineering.

Other shifts throughout the MIS profession include the following:

Genicom Corp. in Waynesboro, Va., named **Fred Young** vice-president and chief financial officer. Genicom, a computer printer manufacturer, said that Young will be responsible for all corporate financial operations and the MIS group. Young previously was vice-president of systems and CFO at Genigraphics, Inc. in Syracuse, N.Y. A graduate of Clarkson College, Young also has worked for IBM and General Electric Co.

Select Magazines, Inc. in New York recently named **Silvio C. Ciafardini** its first vice-president of information systems. Formerly employed in management positions at several major insurance companies, Ciafardini has been at Select's systems organization since 1985, most recently as director of data processing.

Univar Corp. Director of MIS **Robert Cranston** announced the appointment of **Robert J. Riemath** as director of systems support and **Mark A. Spranger** as director of application systems at the Seattle-based chemicals distributor. Most recently, Riemath was vice-president of network and computer services at Rainier National Bank. Spranger was formerly systems development manager at Ernst Home & Nursery.

Hadron, Inc. in Fairfax, Va., announced that **Philip Ashpes** has been appointed vice-president and manager of its engineering and information systems division. Before joining Hadron, Ashpes served as vice-president and division manager at several professional services companies, including Network Solutions, Inc.

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Treating IS as a valued asset, not a painful expenditure

BY ROBERT MORAN
CW STAFF

Corporations should work toward treating the entire information systems infrastructure as an asset rather than an expense, independent consultant Paul Berger told attendees at the first Frost & Sullivan, Inc. CIO Institute conference in New York last month.

Berger, who heads Paul Berger Consulting, Inc. in Lawrenceville, N.J., said that balance-sheet assets should include internally developed systems — data, databases and software — and not just hard-

tricky but proposed that the corporation could devise an initial value and reevaluate every few years.

Berger also noted that every internally developed system that draws on the infrastructure of hardware, operating systems and third-party database management systems should also bear some of the expense of that infrastructure.

However, he added that a corporation can treat its systems as overhead and amortize their costs a year at a time, which

helps position the systems as components intrinsic to the company's success.

"Amortizing the system and all the work that draws from it implies that the company has made an investment that is being used throughout the organization," Berger said. "If the system sits [on the books] at its original value, that implies that the corporation has made a mistake in building a system that has no use."

Berger also noted that corporations can look to experience to find the appropriate time to amortize their systems. Most systems, he said, outlast two or three hardware upgrades and have a life span of 12 to 20 years. Accordingly, between two and three times the length of the hardware life should be the amortization period, Berger said.

Hands-on

CONTINUED FROM PAGE 91

ing to limit his hands-on work for strategic planning and staff skills.

Caron places a good deal of importance on relationships, according to Mike Natan, senior vice-president of the information technology service division. Once he knows and trusts his workers, "that enhances the relationship and amount of autonomy that he allows," Natan says.

Caron and Natan have worked together at Cigna for 16 years. "He's got good instincts in general, but certainly in this business, he is able to get to the core of an issue very quickly," Natan says.

Most of the hardware at Cigna Sys-

ALTHOUGH A corporation may spend \$250,000 building a system and a database, that expenditure can be leveraged into millions of dollars in revenue by creating and supporting new business opportunities.

ware. Such procedures, Berger said, would remove current inadequate measurement processes and place a proper perspective between business and IS measurements. "Most businesses have an asset that never shows up on the books," he said.

Turning information into a corporate asset would cause a series of corporate changes. It would alter both the measurement of business performance and ensure that the MIS group, which has completed a large chunk of the work, does not become this year's expense but rather gets treated like anything with capital, Berger said.

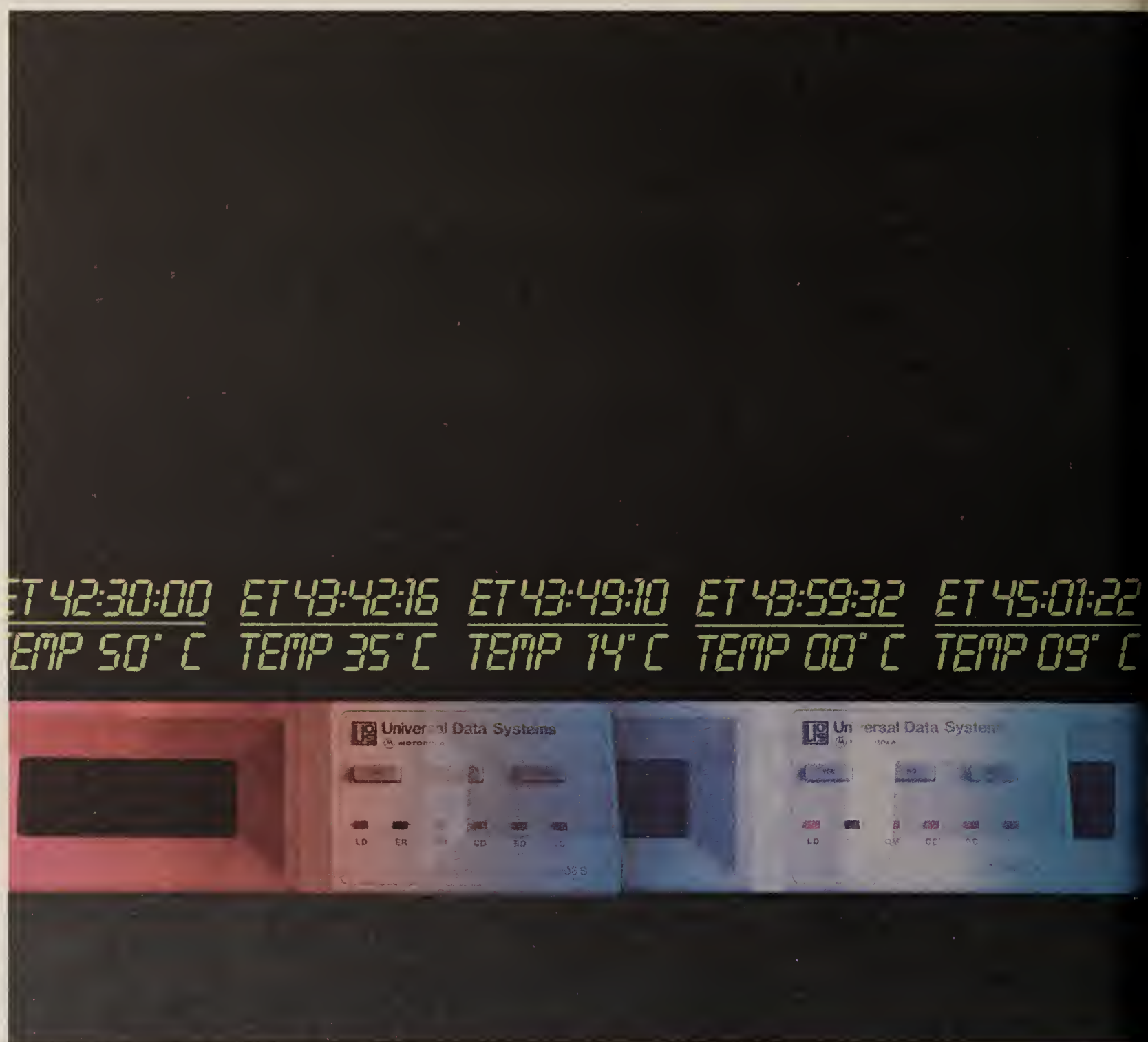
"The first thing that happens is that the corporation begins to look differently at some of the MIS work and some of the business performance," he said.

Berger, currently president of the Society for Information Management, gave the example of a products firm already committed to recasting all of its information systems. The chief executive officer, Berger said, was concerned that the company would suffer a drop in profits in the current year, although he was aware that the systems would carry the organization for the next five to 10 years. By capitalizing the systems, he said, the business measurement would begin to align with MIS performance measurements.

To realign such measurements, Berger said that corporations cannot simply place initial systems costs on the books as assets. The strategy requires an evaluation of either replacement costs that can be adjusted over time, leveraged business value or some combination of the two.

For example, although a corporation may spend \$250,000 building a system and a database, that expenditure can be leveraged into millions of dollars in revenue by creating and supporting new business opportunities.

Berger conceded that attributing the appropriate value to the asset would be



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tems is IBM mainframe-based, and the employees work on 22,000 terminals and 6,000 personal computers, Caron says. The core applications were developed at the division level and include backbone systems such as a health care and a property and casualty application.

Caron says that over the years, Cigna Systems has typically gone with the traditional software tools such as Cobol, IBM's IMS and CICS. "But there is a need to get ready for the next decade," he says. "We need to be better at integrating office automation and workstation strategies into our backbone platforms."

Caron said he is somewhat concerned about systems compatibility, and he will be looking carefully at the data plans for each division. "Where we have data that

is critical across lines," we tend to ensure that our data plans will allow for compatibility, he said. Still, he admits that there is much work to be done in that area.

While some other companies are hiring more information systems workers from management backgrounds rather than those with technical skills, Caron still believes a solid knowledge of systems is the way to go. He should know: He earned his knowledge on the job.

During his teenage years, Caron was like most people his age: He was rather uncertain about the career path he would choose. He was enrolled in the University of Connecticut, but as he ended his sophomore year, his father had a stroke, and Caron's college funding was no longer a priority.

Living in Hartford at the time, Caron made his way into the personnel office of Travelers Insurance Co. After an aptitude test, he was hired to work in the company's data processing area as a computer operator. Next, he moved to programming at another insurance company and eventually joined a small consulting firm before moving to Philadelphia and Cigna in 1971.

On the links, Caron is just a so-so golfer who at least enjoys the game, according to one co-worker who has shot some rounds with him. But at Cigna, Caron has a job to do and he works very hard to get it done. "He's a very hard driver. He wants to get things accomplished — he's not interested in just putting in his time," Natan said.

To date, Caron says things are going

well and the systems division is headed in the right direction. A staff of eight reports directly to Caron, who in turn reports to the corporation's chief financial officer James Stewart, who reports directly to Chief Executive Officer Wilson "Bill" Taylor.

Top-down support has continued to grow within Cigna over the last five years, Caron said.

"Both Bill and Jim tend to bring to the effort a sense of the long-term role that technology can play," which is necessary because no project can happen overnight, he says. "The lead times are so huge that you have to be able to have that vision of what could be, and they both have it as well as the group heads. We're blessed with that."

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LOCAL HAPPENINGS

NORTHEAST

Auburndale, Mass., Feb. 13. The Society of Professional Consultants February meeting. Contact: Bob Larsen, 617-659-2115.

Boston, Feb. 16. The New England EDP Auditors February meeting. Contact: Linda D'Agostino, 617-727-6200, ext. 43.

Boston, Feb. 21. The Information Industry Association New England Area Chapter's February program, featuring David Roux, vice-president of information services at Lotus Development Corp. Contact: Information Industry Association, Suite 800, 555 New Jersey Ave. N.W., Washington, D.C. 20001.

MID-ATLANTIC

Arlington, Va., March 5-6. Baltimore-Washington Information System Educators regional conference, Training Magic II. Contact: Baltimore-Washington Information System Educators, 1559 Rockville Pike, Rockville, Md. 20852.

Baltimore, March 13-April 26. The Baltimore Chapter of the Association for Systems Management's certified systems professional review course, Monday and Wednesday evenings. Contact: Bill Scott, 301-455-2018.

Princeton, N.J., March 13-15. The Art and Science of Developing User Documentation, presented by User Vision, Inc. Contact: User Vision, P.O. Box 371, Holmdel, N.J. 07733.

MIDWEST

Chicago, through April 30. Digital Equipment Corp. and the Kurzweil Foundation sponsor "Robots and Beyond: the Age of Intelligent Machines" exhibition. Contact: The Museum of Science and Industry, 57th Street and Lake Shore Drive, Chicago, Ill. 60637.

Fort Wayne, Ind., Feb. 21. The Association for Systems Management Fort Wayne chapter meeting. Speaker will be Doug Renselle, president of SCS, Inc. Contact: Melonie Givens at 219-432-3975.

WEST

Phoenix, Feb. 15-16. The Central Arizona Chapter of the Institute of Industrial Engineers annual conference entitled "Managing Systems in the '90s." Contact: Larry Jeffers, P.O. Box 61301, Phoenix, Ariz. 85082.

Sacramento, Calif., Feb. 16. The Sacramento Chapter of the Association for Systems Management monthly dinner meeting. Contact: Mike Blank, 916-927-7275.

SOUTH

Nashville, April 9-11. The Seventh Annual Regents' Conference on Higher Education. Theme is "The Critical Link: Technology and Teaching." Contact: Linda Doran, State Board of Regents, Suite 350, 1415 Murfreesboro Road, Nashville, Tenn. 37217.

MANAGEMENT BRIEFS

National Casecon searching for speakers

The **National Computer-Aided Software Conference**, or National Casecon, is calling for speakers, panel members and moderators for its June 20-22 conference in New York.

Industry experts, end users or vendors that want to share computer-aided software engineering (CASE) accomplishments should contact National Casecon, P.O. Box 1807, Englewood Cliffs, N.J. 07632 with an abstract of a proposed CASE paper by Feb. 17. Presentations should consist of 55 to 60 minutes of formal presentation with a 15- to 20-minute allowance for questions and audience interaction.

"Interfaces: Systems and People Working Together" is the theme of the **28th Annual Technical Symposium of the Washington, D.C., Chapter of the Association of Computing Machinery** to be held Aug. 24 in Gaithersburg, Md.

The symposium will explore the theoretical and practical issues associated with interfacing systems and enabling people to use them effectively.

Authors should send five copies of any papers related to the theme by March 2 to Milton Hess, American Management Systems, Inc., 1525 Wilson Blvd., Arlington, Va. 22209. Authors of accepted papers will be notified by April 13.

For more information, call Charles Youman at 703-883-6349.

The **National Communications Forum** has announced its 1989 Comforum Awards Competition. The objectives of the awards are to give recognition to organizations and individuals for excellence and success in the development and commercialization of telecommunications and computer products and to highlight tech-

nological advances in telecommunications and computer products. The awards will be presented during the Oct. 2 NCF '89 Communications Industry Banquet in Chicago. Entry deadline is April 15. For more information, call the program director at 312-938-3500.

The **Southern California Regional Users Group (SCRUG)** has announced that it will award a \$1,500 scholarship to a deserving student who plans to pursue a career in a computer-related field.

The 1989 Scholarship Award Program

requires that applicants or parents or legal guardians must be residents of Southern California, located within zip codes 90000 to 93599. The student must have entered or completed his senior year of high school, and each applicant must either be a current Interex member or be sponsored by an Interex member. The award will be based on academic excellence, the group announced.

The award may be used for tuition, fees or other expenses in any institution of higher learning, including trade schools, community colleges, four-year

colleges or for graduate or post-graduate schooling. For an application form, write to SCRUG, P.O. Box 84219, Los Angeles, Calif. 90073. The application deadline is June 1.

Structural Dynamics Research Corp. is seeking submissions in response to a call for papers for the 1989 I-DEAS/CAEDS User's Conference. Technical papers are being sought for the purpose of sharing knowledge and accomplishments in the use of either the I-DEAS and/or CAEDS software systems. The conference will be held Oct. 3-5 in Cincinnati, and the deadline for submitting an abstract is April 1. For additional details, contact Mary Ward, SDRC, 200 Eastman Dr., Milford, Ohio 45150.

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Applied Learning offers software renovation tape

A videotape on software renovation as an alternative to ongoing software maintenance is available from Applied Learning in Naperville, Ill.

Software Renovation: Justifying the Cost is geared toward directors of MIS and information systems planning and managers of technical support and application development.

The video discusses the reasons that ongoing maintenance and enhancement of existing systems are difficult, time-consuming and costly. It then presents the case for completely renovating software systems, an alternative often cost-justified by improving system quality and software productivity.

The video is part of Applied Learning's Technology Management library of video and computer-based training products.

The tape is about 45 minutes in length, and the rental cost is between \$50 and \$150 per month, depending on rental volume.

Applied Learning is located at 1751 W. Diehl Road, Naperville, Ill. 60540.

Brecht

CONTINUED FROM PAGE 91

pants in the disaster recovery effort. It incorporates a variety of administrative details, including a definition of "disaster" and potential threats and objectives for recovery. It assumes that the computer center is damaged and unusable for 72 hours or more.

Depending on the conditions and the information available, the need to declare a disaster may not be obvious. A good plan defines the action to be taken by the individual who first notices the potential disaster. The names and phone numbers of managers who must be notified immediately are defined to speed communica-

tion among decision makers.

Damage assessment is vital to a disaster declaration decision. Members of a damage assessment team are predetermined and — as with other teams — names, phone numbers and alternates are included in the plan. If the threat is serious enough to consider a declaration, the cognizant corporate officer gathers the team to estimate the potential and time frame for reconstruction.

Questions to be considered include the following: Is the data center completely unusable? Is the damage limited to a particular area? If so, what is the anticipated demand for this area? What surrounding areas experienced secondary effects such as smoke or water damage?

The impact on production processing

is evaluated and, if a disaster is declared, a temporary headquarters is selected from several predetermined sites.

Responsibility for the disaster declaration, subsequent communication and definition of processing priorities at the backup site is assigned. There are procedures to establish and processing priorities to decide on until normal schedules are restored. A petty cash fund to cover out-of-pocket expenses during the first two weeks of the disaster is provided, as is clerical staff to support the recovery effort and systems staff at the backup site. Transportation, delivery services and distribution of output printed at the backup site are also planned.

Procedures to retrieve documentation and backup tapes from remote loca-

tions are included. The plan pre-identifies software requiring temporary licenses to run at the hot site. Restoration of data library and data security procedures are laid out. Vendors for the emergency replacement of critical forms or laser printer form flashes, bursting and decollating are identified. The addresses of the remote printers available for users are specified.

Furnishings for staff at the backup site should be "guesstimated" in advance, and the eventual return of personnel, processing and materials to the restored facility is planned. The plan should look at the backup site's ability to support the work load and the possible need to add processing capacity during an extended stay at that site.

Equipment salvageability is also addressed. Members of a salvage team are predetermined, and an inventory is stored off-site and will serve as the basis for the paperwork required to reorder equipment. The need for cleaning services for facilities, equipment and magnetic media is anticipated.

Providing staff with accurate information on the status of the disaster recovery effort minimizes the stress and the probability of losing key staff members. The plan uses the local media and telephone lists to keep staff informed.

Even when participants in a disaster recovery effort are familiarized with the plan and the company's ability to restore operating systems and telecommunications is tested regularly, there remains the need to plan for the recovery of individual production applications.

Applications recovery plan

A data center disaster degrades service and makes hard choices necessary. Restoration of operating systems and telecommunications at a remote site is useless unless applications can be recovered.

Ideally, recovery plans are a corporate priority, addressed at the time of system development and major modifications.

The initial section of the application recovery plan deals with administrative detail such as procedures to authorize activation of the plan. The process used to assign processing priorities and communicate the status of the recovery to affected individuals are included as are the details to reestablish processing to minimize loss and restore service to customers as quickly as possible.

Methods to keep impacted users and customers informed of the recovery effort and provide the media with timely and accurate information are provided. Each predefined application recovery team includes representatives from each group necessary to the finished product. Identification of critical products, services and data files and evaluation of the documentation constitutes a joint effort between the systems group and users and is best done before the disaster.

Disaster and application recovery planning are not exciting pursuits. They require painful attention to detail when, in fact, plans may never be used. To be effective, they must be maintained and tested on a regular basis. In spite of what may be wasted effort, they are necessary. The inability to restore major applications in the event of a disaster can easily mean the end of your company.

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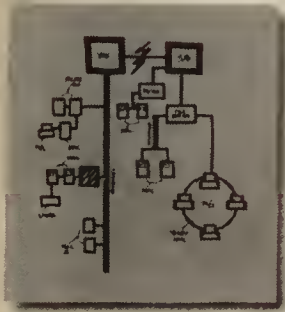
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CALENDAR

FEB. 12-18

ABA 1989 Bank Telecommunications Conference (TELCOM '89). New Orleans, Feb. 12-15 — Contact: American Bankers Association, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

Development Center Institute Conference. Orlando, Fla., Feb. 12-15 — Contact: Development Center Institute, P.O. Box 44087, Indianapolis, Ind. 46244.

Electronic Printing Systems/Professional Electronic Publishing Conference. Orlando, Fla., Feb. 12-16 — Contact: Electronic Printing Systems, Suite 1, E. Vista Way, Vista, Calif. 92084.

First Interstate Bank of California Business Recovery Seminar. Newport Beach, Calif., Feb. 13-14 — Contact: First Interstate Bank of California, Business Resumption Planning G8-8, 1200 W. 7th St., Los Angeles, Calif. 90017.

"Lost Frontier" Conference on Computer Software Copyright Issues. Tempe, Ariz., Feb. 13-14 — Contact: Rosalind Pearlman, Center for the Study of Law, Science and Technology, College of Law, Arizona State University, Tempe, Ariz. 85287.

Invitational Computer Conference on Computer Graphics. Newton, Mass., Feb. 15 — Contact: ICC, No. C-2, 3151 Airway Ave., Costa Mesa, Calif. 92626.

Connectathon '89. Santa Clara, Calif., Feb. 17 — Contact: Eric Radman, Sun Microsystems, (415) 336-1282.

FEB. 19-25

ACM Annual Computer Science Conference: Emerging Computer Trends of the 1990s. Louisville, Ky., Feb. 21-23 — Contact: Association for Computing Machinery, Conference Department A, 11 W. 42nd St., New York, N.Y. 10036.

Directions In Manufacturing — Keys to World Class Performance In 1990. Miami, Feb. 21-24 — Contact: Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio 45211.

Standards For Computer Integrated Manufacturing. Gaithersburg, Md., Feb. 21-24 — Contact: Society of Manufacturing Engineers, Technical Activities, One SME Drive, P.O. Box 930, Dearborn, Mich. 48121.

Image Processing and Electronic Document Control '89. New York, Feb. 22-23 — Contact: Institute for International Research, 6th Floor, 331 Madison Ave., New York, N.Y. 10017.

Concurrent Conferences: Interactive Instruction Delivery, Electronic Marketing and Consumer Information Delivery and Learning Technology in the Health Care Sciences. Kissimmee, Fla., Feb. 22-24 — Contact: Learning Technology Institute, 50 Culpeper St., Warrenton, Va. 22186.

Knowledgeware, Inc.'s Annual International User Conference. Atlanta, Feb. 22-24 — Contact: 1989 International User Conference, Knowledgeware, Suite 1100, 3340 Peachtree Rd. N.E., Atlanta, Ga. 30326.

FEB. 26-MARCH 4

EFTA Expo and Convention. Miami Beach, Feb. 26-March 1 — Contact: Electronic Funds Transfer Association, Suite 1000, 1726 M St., N.W., Washington, D.C. 20036.

Western Regional Conference for Bank Card and Consumer Credit Monitors. Anaheim, Calif., Feb. 26-March 1 — Contact: American Bankers Association, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

IDMS User Association Conference. New York, Feb. 26-March 2 — Contact: IDMS User Association, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

East Coast Business and Government Computer Exhibition. Washington, D.C., Feb. 27-March 1 — Contact: International Spectrum, Suite 103, 10675 Trenea St., San Diego, Calif. 92131.

Trax User Group Conference. Marina del Rey, Calif., Feb. 27-March 1 — Contact: Robert Pack, Trax Softworks, 10801 National Blvd., Los Angeles, Calif. 90064.

International Association For Computer Operations Management (AFCOM): Focus on Operations. San Diego, Feb. 27-March 2 — Contact: AFCOM, 742 E. Chapman Ave., Orange, Calif. 92666.

Data Base: The New Era. Minneapolis, Feb. 27-March 3 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

Association of Records Monitors and Administrators' Annual Records Mon-

agement Southern Conference. Charlotte, N.C., Feb. 28-March 1 — Contact: ARMA, South Carolina Chapter, P.O. Box 11709, Columbia, S.C. 29211.

Network 89. Boston, Feb. 28-March 2 — Contact: Network 89, P.O. Box 1521, Englewood Cliffs, N.J. 07632.

Uniforum, the International Conference of Unix Operating System Users. San Francisco, Feb. 28-March 2 — Contact: Uniforum 1989, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

International Data Corp.'s 24th Annual Computer Industry Briefing Session. Washington, D.C., March 1 — Contact: International Data Corp., 5 Speen St., Framingham, Mass. 01701.

NCGA Executive Briefing on CALS (Computer-Aided Acquisition and Logistics Support) Policy. Washington, D.C., March 1 — Contact: NCGA Corporate Dept., P.O. Box 3412, McLean, Va. 22103.

Securicom 7th Worldwide Congress on Computer and Communications Security and Protection. Paris, March 1-3 — Contact: Securicom, 8 Rue De La Michodiere, Paris, France. 75002.

Systems Development Conference. Toronto, March 2-3 — Contact: Association For Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

MARCH 5-11

Federal Office Systems Expo, FOSE Software and FOSE Graphics. Washington, D.C., March 6-9 — Contact: National Trade Productions, Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

Annual Convention of the Alpha Micro Users Society. Irvine, Calif., March 6-10 — Contact: Alpha Micro Users Society, 735 Walnut St., Boulder, Colo. 80302.

BRS Information Technologies User Meeting. San Diego, March 6-7 — Contact: BRS Information Technologies, 1200 Rt. 7, Latham, N.Y. 12110.

Conference on EDP Performance/Capacity Management. Phoenix, March 6-10 — Contact: Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

IEEE Conference on Artificial Intelligence Applications. Miami, March 6-10 — Contact: The IEEE Computer Society, 1730 Massachusetts Ave., N.W., Washington, D.C. 20036.

Software Re-engineering Symposium. San Francisco, March 6-8 — Contact: Digital Consulting, 6 Windsor St., Andover, Mass. 01810.

Voice '89 Conference and Exposition. Santa Clara, Calif., March 6-8 — Contact: Information Publishing Corp., P.O. Box 42375, Houston, Texas 77242.

CAD/CAM/CAE Strategy Workshops '89. Cambridge, Mass., March 7-8 — Contact: Daratech, P.O. Box 410, 140 6th St., Cambridge, Mass. 02238.

Profiting From Mission-Critical Systems. Boston, March 7-8 — Contact: Laura DeMaio, Business Research Group, 221 Columbus Ave., Boston, Mass. 02116.

Public Conference of the American National Standards Institute. Washington, D.C., March 7-8 — Contact: American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

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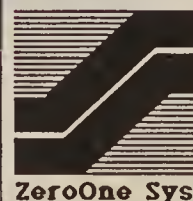
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Charles Varga

Song remains the same



With the passing of the shortest days and the longest nights of the year — the winter solstice — the entire computer world awaits new words of wisdom from industry forecasters, analysts and soothsayers all claiming to have the answers to why things did or didn't happen in 1988 and accurate predictions for what 1989 has in store.

Words, words, words! Are the words we are hearing today manna from heaven, gospel or just exercises in elocution? I don't know about you, but even after attending several conferences recently, I'm confused. The words are all sounding much the same as they did several years ago. Only the background color of the slides has changed.

The first rounds are usually fired by industry leaders: "The President of XYZ Software Corp. said that due to a delay in completion and shipment caused by cracks in our Alabaster Software Version 3.40, revenue and earnings forecasts for the fourth and first quarters will be substantially reduced." And a principal of ABC Corp. said that "increased software development costs

Continued on page 102

Merging in leaps and bounds

Report finds IS and software industry mergers generating money hand over fist

BY NELL MARGOLIS
CW STAFF

Megadeals and multinational zeal catapulted the dollar value of information services and software industry mergers and acquisitions beyond the \$8 billion mark in 1988, close to double the 1987 value, according to a recently issued Broadview/ADAPSO Report.

In addition, according to Broadview Associates, what we are seeing is still the upward slope of a trend that shows no signs of tapering off.

The report, compiled annually by Broadview, a Fort Lee, N.J.-based investment banking and mergers and acquisitions consulting firm for ADAPSO, the computer services and software industry association, showed an industry sector marked by increasing awareness of the importance of information

and the clout inherent in the combination.

In addition to the 70% surge in dollar value over 1987's \$4.9 billion bottom line, the number of transactions was up 21% to 434 deals.

Fourteen of them topped \$100 million, compared with nine such megadeals in 1987 and a mere five in 1986. The steep rise in amounts spent, said Broadview partner Edward Metz, underscores "the mounting strategic importance of information software and services in our economy."

Good deals

The deals going down, Metz said, "are not just large but are very rich deals." One of the reasons that companies are paying such rarely heard of premiums as three to four times the revenue for information companies —

and who knows better the value of information? — are starting to show up more frequently on the buyer side, he said.

Three such transactions, in fact, showed up in Broadview's Top 10: Dun & Bradstreet Corp.'s \$1.6 billion purchase of IMS International, which ranked as No. 1; TRW, Inc.'s purchase of Borg-Warner Corp.'s Chilton Credit Division for \$360 million; and Knight-Ridder, Inc.'s \$353 acquisition of Lockheed Corp.'s Dialog division.

For the most part, 1988 emerged as a year in which earlier noted trends in the software and services sectors continued and escalated.

- Activity continued apace on two levels: The 10 largest transactions, said Broadview partner Gilbert Mintz, represented 2% of the number of deals but accounted for 50% of the total dollar volume. The remaining 98% had a median value of less than \$4 million.

- Microcomputer software firms were the hottest commodity but far from the most expensive: They accounted for 25% of the total number of deals but less than 5% of the total dollar value.

Continued on page 101

Chip pilfering steady despite shrinking price

BY J. A. SAVAGE
CW STAFF

A semiconductor company employee easing a few little chips into a pocket may seem like a small crime, but last year in California's Silicon Valley, these thefts were likely worth more than \$3 million. And while the price of the most desirable chips is declining, law enforcement officials said they do not expect to see an associated decline in thefts.

"We did see an upsurge in chip thefts" associated with the high price and shortage of dynamic random-access memory (DRAM) chips, said Ken Rosenblatt, a Santa Clara County district attorney. "The suspicion is that we won't see a marked de-

crease, in some part because there is still the perception they are valuable."

Recent incidents indicating the extent of the problem in California include the following:

- Late last month, \$1.1 million worth of Sun Microsystems, Inc. DRAM chips were recovered in a receiving-area storage locker in Milpitas. The chips are mounted on modules the size of a candy bar, a Sun spokeswoman said.

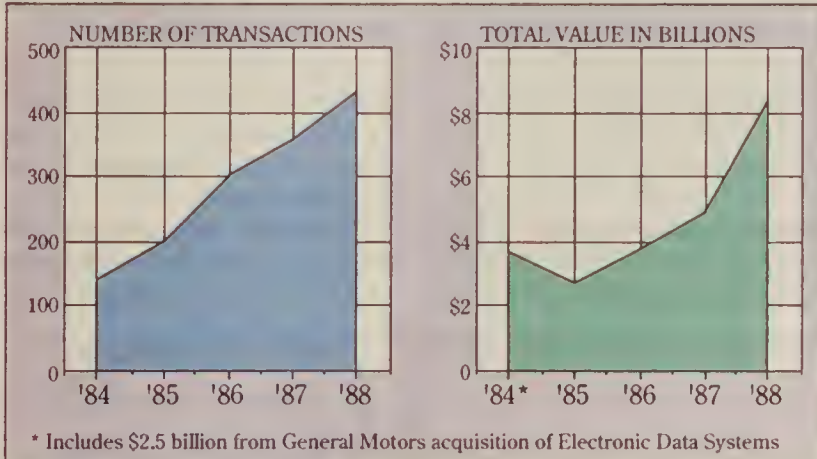
- Late last year, chips valued at six figures were reported stolen from Qume Corp. in Milpitas and Televideo Systems, Inc. in Sunnyvale.

- Micron Technology, Inc. in Boise, Idaho, had reports that up to 17.5 million of their DRAM chips were for sale in Hong Kong

Continued on page 106

Straight up

Information services and software sector mergers abound



SOURCE: BROADVIEW ASSOCIATES
CW CHART: FRANK C. O'CONNELL

Market Vision hands out real-time ammo

BY CLINTON WILDER
CW STAFF

NEW YORK — Nowhere is the concept of information for competitive advantage more tangible than on the desk of a Wall Street securities trader. For the people who author Tom Wolfe called "Masters of the Universe," real-time data means better kill-or-be-killed decisions in the high-stakes brokerage industry.

So Market Vision Corp. has a straightforward mission — supplying software for traders via high-powered workstations to help them make better decisions faster.

Market Vision's Unix-based products give traders both real-

time and historical financial data stored on Market Vision's Digital Equipment Corp. VAXs and accessed by the customer through Ethernet. To graph this data, Market Vision offers software tools such as the Athena graphics package and the Market Data Spreadsheet.

We're here

The 6-year-old company has found itself at the heart of Wall Street's information technology revolution. Workstations from Sun Microsystems, Inc., Apollo Computer, Inc., DEC and IBM have conquered the trading desks [CW, Aug. 24, 1987]. Market Vision, after a slow start in the mid-1980s, now says it believes its time has come.

"When we first started, we were considered costly, complex, closed and large — the system off in the corner," said William F. Adiletta, Market Vision's president and chief operating officer. "The feeling among traders was, 'Why would I ever want an engineering workstation on my desk?' Now, we have some of the best traders on Wall Street as customers."

Market Vision endured many of the growing pains of a start-up. It failed to meet the early revenue goals established by its venture capital backers, and its founder, former Wall Street trader Keith Schneider, departed. Adiletta, a former on-line systems and database consultant, was promoted from Market

Vision's vice-president of engineering to president in 1987.

The company now employs 35 people and has 160 customer accounts, up from just 30 in 1986. Based in the heart of New York's financial district, the firm

currently does annual business of about \$5 million.

The 1987 stock market crash actually helped Market Vision business, according to Adiletta. "When markets have a lean peri-

Continued on page 107

Up & Coming: Market Vision

Location: New York

Incorporated: 1983

President: William F. Adiletta

Employees: 35

Product line: Unix-based financial databases, analytical tools and graphics for securities traders

Of note: Fivefold increase in customer accounts since 1986

NICKELS & DIMES

Computer Sciences Corp. announced revenue for the third quarter ended Dec. 30 of \$345.4 million, compared with \$287.3 million the year before. Profits were \$12 million, or 75 cents per share, compared with \$10.3 million, or 65 cents per share, a year ago.

Duquesne Systems, Inc. announced revenue for the first quarter ended Dec. 30 of \$15.3 million, compared with \$12 million in the previous year. Profits were \$3.6 million, or 33 cents per share, compared with \$2.7 million, or 27 cents per share, in the like period a year ago.

Hogan Systems, Inc. reported net income of \$2.1 million, or 16 cents per share, on revenue of \$11.1 million for its third quarter ended Dec. 31. This compares with net income of \$1.9 million, or 13 cents per share, on revenue of \$12.1 million reported last year.

Boole & Babbage, Inc. announced revenue for the quarter ended Dec. 31 of \$17.1 million, compared with \$12.3 million in the previous year. Profits were \$1 million, or 28 cents per share, compared with \$686,000, or 21 cents per share, in the like period a year ago.

Borland International announced net income of \$874,000, or 14 cents per share, on revenue of \$23.6 million for the third quarter ended Dec. 31. This compares with net income of \$933,000, or 15 cents per share, on revenue of \$21.7 million reported in the correspond-

ing period a year ago.

Priam Corp. announced revenue for the second quarter ended Dec. 31 of \$32 million, compared with \$34.7 million a year ago. The company reported a net loss of \$4.8 million, or 19 cents per share, compared with net income of \$0.4 million, or 2 cents per share, for the like period a year ago.

Interleaf, Inc. reported earnings of \$82,000, or 1 cent per share, for the third quarter ended Dec. 31. This is compared with \$1.6 million, or 14 cents per share, in the previous year. Revenue for the quarter was \$21.3 million, compared with \$17 million for last year's period.

Diebold, Inc. announced net income for the fourth quarter ended Dec. 31 of \$9.2 million, or 70 cents per share, compared with \$11.9 million, or 91 cents per share, in the same quarter last year. Revenue was \$117.2 million, compared with \$119.3 million in the previous year.

Net income for the year was \$35.8 million, or \$2.72 per share, compared with \$35.8 million, or \$2.72 per share, a year ago. Revenue was \$450.6 million, compared with \$439.1 million in the previous year.

The Reynolds and Reynolds Co. announced revenue for the first quarter ended Dec. 31 of \$143.6 million, compared with \$138.4 million last year. Profits were \$7.1 million, or 66 cents per share, compared with \$2.8 million, or 26 cents per share, in the like period a year ago.

Dataproducts Corp. reported revenue of \$94.5 million and net income of \$1.6 million, or 8 cents per share, for the third quarter ended Dec. 24. This compares with revenue of \$91.2 million and net income of \$1.1 million, or 5 cents per share, reported for the same period a year ago.

Businessland, Inc. announced revenue for the second quarter ended Dec. 31 of \$301.3 million, compared with \$258.3 million last year. Profits were \$9.5 million, or 32 cents per share, compared with \$5.3 million, or 19 cents per share, in the previous year.

Pyramid Technology Corp. reported revenue for the first quarter ended Dec. 30 of \$24.5 million, compared with \$17.5 million a year ago. Profits were \$2.4 million, or 28 cents per share, compared with \$1.8 million, or 22 cents per share, in the like period a year ago.

Iomega Corp. announced revenue for the fourth quarter ended Dec. 31 of \$26.5 million, compared with \$29.2 million from the previous year. Profits were \$1 million, or 6 cents per share, compared with \$2.4 million, or 15 cents per share, in the previous year.

Quantum Corp. announced revenue for the third quarter ended Jan. 1 of \$51.6 million, compared with \$56.7 million last year. Profits were \$3.3 million, or 36 cents per share, compared with \$4.7 million, or 51 cents per share, a year ago.

Computer Power Group Ltd. reported revenue for the year ended Sept. 30 of \$221 million.

Net operating profits before taxes and interest for fiscal year 1988 rose to \$16.6 million. Net profits for fiscal year 1988 were \$9.4 million.

Because of a changeover from a June 30 to a Sept. 30 fiscal year's end, all revenue figures for fiscal year 1988 are for a 15-month period.

Computer Power Group America, Inc., a wholly owned subsidiary of Computer Power Group Ltd., generated \$58.7 million in revenue for fiscal year 1988, 26.6% of the parent company's worldwide total. Net profits before taxes and interest from the subsidiary totaled \$6.2 million.

Microcom, Inc. announced revenue for the third quarter ended Dec. 31 of \$14.8 million, a 67% increase over the \$8.9 million reported a year ago. Profits were \$2 million, or 50 cents per share, up 72% from the 29 cents before extraordinary credit reported one year ago.

ELXSI Corp. reported estimated fourth-quarter computer sales and service revenue of \$5.3 million and an estimated 1988 fourth-quarter net loss of \$3.7 million.

The fourth-quarter revenue represents an 18% increase over the previous quarter and compares with 1987 fourth-quarter computer sales and service revenue of \$5.5 million and a net profit of \$207,000.

The estimated loss per share of 4 cents for the fourth quarter of 1988 compares with breakeven per-share results for the fourth quarter of 1987.

Computer sales and service revenue for 1988 was estimated at \$20.4 million, compared with

revenue of \$25.2 million for the corresponding period in 1987. The estimated 1988 net loss of \$9.8 million, or 11 cents per share, compared with net income of \$850,000, or 1 cent per share, in 1987.

Estimated results for 1988 include nonrecurring gains of \$2.1 million, compared with nonrecurring gains during 1987 of \$5.5 million.

Concurrent Computer Corp. reported record sales of \$90.7 million for its second quarter ended Dec. 31.

The company was formed Sept. 27 by the combination of the Tinton Falls, N.J.-based firm of the same name with Massachusetts Computer Corp. in Westford, Mass. The name Concurrent Computer was chosen for the combined companies.

The \$90.7 million sales are compared with \$19 million for the second quarter of the previous year, which does not include those of the former Concurrent. Second-quarter sales on a pro forma combined basis represented an increase of 7.1% from \$84.7 million sales a year earlier.

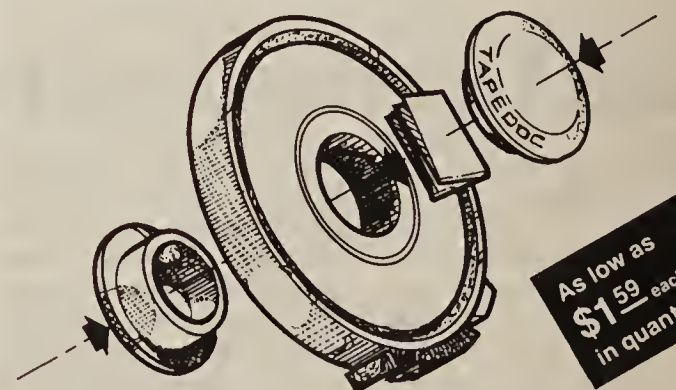
Despite record sales, the company reported a second-quarter loss of \$14.8 million, or 83 cents per share, vs. a profit of \$0.9 million, or 6 cents per share, in the prior year. Results of operations of the former Concurrent are not included in the prior year.

The company attributed the loss to noncash charges that were related to the allocation of the purchase price to the acquired assets of the former Concurrent. These noncash charges reduced net income by approximately \$15.5 million, or 87 cents per share.

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Chip pilfering

FROM PAGE 99

and Singapore. However, a spokesman for the company said that the existence of the chips, which were offered for sale under the Micron name, could not be substantiated. "We seriously doubt there are many Micron chips there; it sounds like a scam," he said.

Unlike companies based in Silicon Valley, which law en-

VICTIMS ARE generally those who deal with distributors in small quantities."

DEAN MCCARRON
IN-STAT

forcement officials said has well-entrenched black-market distribution channels, Micron has no evidence of chip thefts from the company. "It's extremely difficult to move parts in Idaho. They'd have to be sent to California," the spokesman said.

In Northern California, "Chips are stolen with a high degree of frequency," said Dennis Holmes, a Milpitas Police Department detective.

In the last two months, he said, there was a total of nine reports of stolen chips. They are mostly in the pocket-full category — 30 and 50 at a time, unlike the Sun cache. Chip stealers do not go after their prey with loaded weapons at convenience stores. Usually, their main challenge is eluding the omnipresent

security cameras.

"Size alone makes it so simple. You can put 60 DRAMs in your pocket and no one would know the difference," said Steven Petrakovitz, a Milpitas police detective.

While police and prosecutors see the matter as straightforward burglary, the lack of physical force against others, or even forceful entry into storage areas, makes standard prosecution a bit thorny.

"Judges treat them like white-collar criminals," Rosenblatt complained. Prosecution is also complicated because chips have little, if any, identification.

In the occasions he has been able to get convictions — twice last year, with four cases pending — Rosenblatt said that either unique chips were involved, or the amounts of chips the thieves tried to sell matched the amounts of chips stolen.

"They're difficult to label; the labeling is just paint on plastic," said Dean McCarron, an analyst at In-Stat, Inc. in Scottsdale, Ariz. "If you're less than ethical, you just get rid of the paint on the package and relabel it."

Companies will not go to the trouble of labeling individual chips because it is too expensive, and "companies don't want to do anything that raises the cost of packaging," McCarron said.

Buyers can do several things to make sure they are not receiving stolen property. McCarron suggests that they can run tests on sample quantities or use an oscilloscope to establish a particular company's "fingerprint."

"The biggest thing is buying directly from the manufacturer. Victims are generally those who deal with distributors in small quantities," he said.

Merging

FROM PAGE 99

About 20% of the deals made were for service firms.

• Favored by exchange rates and fueled by a perceived need to play in the North American market (see story this page), foreign buyers of U.S. companies loomed larger than ever in the 1988 survey: there were 37 such deals, up from 25 last year, and 19 the year before.

Are U.S. firms shopping abroad to the same extent? "No," Metz said, "and mostly because the countries involved aren't allowing us to. The approval process in many European countries is really outrageous."

One 1988 event likely to seed a new trend, Metz said, is the "first real merger of equals" in the software and services sector: last fall's wedding of Duquesne Systems, Inc. and Morino Associates.

The resultant, yet-to-be-named systems integration firm "actually combines strengths rather than balances weaknesses," he said. "It should become a role model for companies looking for a way to build a stronger, tighter industry sector."

Moreover, Metz added, by today's standards, Duquesne's and Morino's capitalization at approximately four times its combined revenue prices the company beyond the reach of corporate raiders.

Winning an American prize

Last fall, British computer company IMP bought its way into the U.S. market. According to cofounder Mark I'Anson, his company had to climb over two other UK companies to do it.

In I'Anson's opinion, IMP walked away with a prize indeed: Parallel Computers, Inc., a Santa Cruz, Calif.-based venture-backed 1982 start-up, whose technology — parallel processing computers and a line of Unix-based fault-tolerant machines — outdistanced its management/marketing mix. When Parallel went on the block, four bidders instantly emerged: one domestic company and three British entrants.

"One of the major U.S. companies becoming heavily involved in Unix should have picked up Parallel right off," I'Anson said. "I don't understand why one didn't."

Now, as chief executive officer of IMP's first American subsidiary, renamed Integrated Micro Products, Inc. and about to introduce its first product line at Uniforum later this month, I'Anson is just as happy to be baffled. "I know exactly which companies ought to have bid on Parallel," he said. "Theirs will be the first doors we will knock on to sell them our products."

Are American companies mere spectators at the scene of what I'Anson called "a new British invasion"? Often, I'Anson said. The reasons, he speculates, originate on both sides of the Atlantic and are more psychological than financial or legal. "Without a doubt, the exchange rate

makes it easier for us to buy in the U.S. than the other way around," he said. "But that's just one part of the picture."

More significant, he believes, is a newly aggressive, highly entrepreneurial business spirit that is sweeping across the UK, just as the challenges of maturity are beginning to take at least a temporary toll in the U.S.

"This is just my observation," the Yorkshireman from California was quick to add. "But the U.S. computer industry seems to have lost some of its guts, its taste for risk," he said. In England, on the other hand, "after a long period of feeling that we simply couldn't compete in technology at the same level as the U.S., there's a genuine feeling of, 'We're as good as they are — let's bloody go show them!'"

Along with mounting confidence, I'Anson said, there is also a distinct sensation within the British computer industry that "if you're not playing in the U.S. market, you're not really a player." And the best — sometimes the only — way to break into that quintessential market, he added, is through a U.S. subsidiary.

A case in point is IMP, I'Anson said. "I've spent four years knocking at doors in the U.S., and every one has been shut in my face," he said. "Now, here I am, offering the same products but with a return address in California — and I'm beating customers away."

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Varga

FROM PAGE 99

and write-downs of goodwill for acquisitions will have a dramatic impact on previously disclosed earnings estimates."

Now for the good news. A high flier in our industry has noted "unexpected after-tax gains of several hundred millions of dollars on the sale of LMNOP division." As a result, "1988 earnings per share will not be materially affected and are generally expected to be in line with Wall Street forecasts."

Now emerge the Punxsutawney Phils of the computer industry, signaling the arrival of springtime in technoland with a new series of estimates, forecasts and justifications for why things changed from what they said before. "Product acceptance in the marketplace was slower than anticipated," they say. "Although the fundamentals of our industry are sound, uncertainty reinforces our emphasis on selectivity."

I have learned skepticism the hard way, watching and wincing at the wise and wondrous forecasts and estimates of markets and market share, earnings and per share. If an industry has between 5,000 and 6,000 vendor participants, the analyst-forecaster might take the top 200, rank them by revenue amount and then interview a portion of the top 50 to ascertain from them what they think the market for their goods and services will be in the current year and also in the year following.

Hopefully, the forecaster has the previous year's estimates; three points will give

him a better estimating curve than just two. (Although I do know of some cases where, forsaking other data, the two-point estimating curve has been indiscriminately foisted upon unsuspecting, trusting victims.)

This new round of words is then flashed to the industry. Some vendors and analysts genuflect and bow; some gag and choke. And the numbers appear in business plans, justifying new investments in venture development opportunities that promised unsurpassed earnings, growth and wealth for all.

Throughout this process, however, one group is rarely, if ever, mentioned — the users, buyers and clients. If the forecasters, analysts and soothsayers took the time and trouble to sample 1,000 or even 500 qualified buyers of these products and services, then they might quickly come to the conclusion that the market is not growing at 24.8% but at, say, 12.4%.

This, of course, would cause a mid-year grinding of teeth and knocking of heads within the vendor community — to the detriment of the investors/shareholders who believed those pundits in the first place.

Yet still the pronouncements come. Perhaps it's time to reevaluate the research methods the forecasters use, to put less emphasis on the wishful thinking of the products' creators and more on the reactions of the users — the clients — who, after all, must bear the ultimate cost.

Varga, a 20-year computer industry veteran based in Frenchtown, N.J., is publisher of "The Cerberus Report," a study of industry mergers and acquisitions.

EXECUTIVE CORNER

J. Phillip Cooper has been named president and chief executive officer of Applied Expert Systems, Inc. in Cambridge, Mass. He was most recently an executive vice-president at McGraw-Hill, Inc., heading that firm's New York-based securities information services and its Lexington, Mass.-based data resources organizations.

Pansophic Systems, Inc. named **G. Gordon M. Large** as vice-president and chief financial officer, effective immediately. Large has 25 years' experience in finance, administration and planning and has held executive-level positions at international technology companies such as Martin Marietta Corp. He joins Pansophic from Palladian Software, Inc., where he served as senior vice-president and chief financial officer.

Pansophic also announced the election of **Kenneth N. Pontikes** to its board of directors, effective December 12, 1988. Pontikes is president and chairman of Comdisco, Inc.

Computer Solutions, Inc. announced that **David A. Litwack**, 41, has joined the company as senior vice-president of research and development. Litwack will be responsible for all product development and technical services at Computer Solutions.

Formerly executive vice-president of product development at Cullinet Software, Inc. in Westwood, Mass., Litwack was responsible for all the company's products, including applications, databases and tools.

Britton Lee, Inc. announced that **Robert W. Taylor** has been promoted to the post of executive vice-president of research and development and chief technical officer.

Taylor, who joined Britton Lee from IBM in 1984, previously held the position of senior vice-president of strategic partnering and was responsible for future product direction and the forming of strategic alliances. Prior to that, Taylor served as senior vice-president of engineering and directed all current and future hardware and software development.

Voicemail International, Inc. has appointed **Roy Schiele** as its president and chief operating officer.

Since joining the company as COO in May 1988, Schiele has been responsible for the company's administration, engineering and operation functions.

Megascan Technology, Inc., manufacturer of high-resolution computer graphics displays, named **Vahram V. Erdekian** president and CEO. Erdekian joins Megascan from Data General Corp., where he was responsible for all North American manufacturing operations.

Erdekian is responsible for all operations at Megascan. He replaces former President and cofounder **Brian Rosen**, who will retain his position as chairman of the board.

Xylogics, Inc. announced the promotion of **Peter P. Savage** to president and the newly created post of COO. He reports to **Bruce J. Bergman**, formerly president and CEO, who continues as chairman and chief executive officer.

Replacing Savage in his former role as vice-president of engineering is **Thomas M. Dennis**, who reports to Savage. Dennis joins Xylogics from AT&T Bell Laboratories, where he spent 15 years in various engineering development and management positions.

RAXCO, Inc., a developer and supplier of utility and system software, has named **Richard Lefebvre** president and CEO.

Lefebvre was most recently the COO at Sage Software and formerly president of Multimate International.

Delphax Systems, Inc. announced that **Alex Cimochowski** has been named the company's president and CEO.

Cimochowski is a founder and the immediate past president of Edge Computer Corp., a computer company specializing in superminicomputers that are compatible with the Motorola, Inc. 68000 instruction set.

Storage Technology Corp. announced the appointment of **L. Thomas Gooch** to the position of executive vice-president of operations. Corporate vice-president of manufacturing since June 1987, Gooch also served as vice-president of the Americas/Pacific operations, federal systems operations and worldwide field engineering.

Before joining Storage Tek in 1972, he spent five years in various positions at IBM's field engineering group.

Datapoint Corp. announced the appointment of **James R. Barnes** as vice-president of technical operations. Barnes will be responsible for worldwide marketing, product development and manufacturing at the computer manufacturer, according to **Robert J. Potter**, Datapoint president and CEO. Immediately prior to joining Datapoint, Barnes was vice-president and general manager of volume products at Data General.

Businessland, Inc. cofounder and Vice-Chairman **Enzo N. Torresi** has accepted the position of president and CEO of Netframe Systems, Inc. (formerly Clustrix Corp.) in Sunnyvale, Calif. Torresi will continue to serve as a member of the Businessland board of directors.

Aion Corp. announced the appointment of **Larry Cohn** to the position of president and newly created post of COO. He has also been appointed to Aion's board of directors. Cohn is a cofounder of Aion and has been the senior vice-president of development. Former President **Harry Reinstein**, also a company cofounder, retains the posts of chairman and CEO.

Bruce H. Rampe has been named president and CEO of BBN Software Products Corp. Rampe has been at BBN since 1985, most recently as vice-president of worldwide sales.

QED Information Sciences, Inc. announced the appointment of **Stewart L. Stokes Jr.** to the post of senior vice-president. Stokes joined the company in May 1988 and was responsible for client activities in management education, interpersonal skills training and associated consulting services.

In his new post, Stokes will play an expanded role in forging the company's direction and strategies.

Prior to joining QED, Stokes was associate director of the American Institute of Banking in Boston and a member and associate dean of Babson College's School of Continuing Management Education.

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Javelin ends career with acquisition

BY DOUGLAS BARNEY
CW STAFF

WALTHAM, Mass. — A near four-year journey has ended for Javelin Software Corp., a 1985 personal computer start-up that began boldly but ended with a whimper.

The Cambridge, Mass.-based company was part of the Gang of Three, a group of high-profile 1985 software start-ups that also included Ansa Software, which was acquired by Borland International, and Symantec Corp., which is growing and still planning to go public. Javelin was acquired last week by Information Resources, Inc.

Javelin had what the industry considered to be an innovative and well-crafted product, one that garnered software awards the way hunters collect trophies. But Javelin made a classic mistake. It positioned itself squarely against an en-

JAVELIN made a classic mistake. It positioned itself squarely against an entrenched industry leader. Like so many others with the same strategy, it failed.

trenched industry leader. The start-up sent out strong signals that it planned to replace Lotus Development Corp.'s 1-2-3 spreadsheet with its own multidimensional database system. And like so many others with the same strategy, it failed.

Once it hit the 1-2-3 brick wall, Javelin attempted to reposition the product to appeal to users who had run out of steam with their spreadsheets. But here, conventional database management systems, statistical software, accounting packages and custom offerings were already filling the void. "Javelin was saddled with an earlier image as a head-on competitor with 1-2-3. Once the die is cast, people think of you that way," said Jeffrey P. Stamen, president of Information Resource's Decision Support Software division.

In 1986, Javelin tried another classic software maneuver. It cut prices radically. This boosted sales but was not enough to provide the high growth a start-up needs. At the same time, the firm laid off domestic sales representatives.

Getting acquired began to look like the best alternative. Throughout last year, Javelin was pursued by a number of suitors, according to founder and Chief Executive Officer Robert L. Firmin. Information Resources just happened to win out.

Information Resources will dramatically reposition Javelin in an attempt to merge it with the firm's Express family. Javelin will provide an easier-to-use interface and an entry-level avenue into the Express series. Javelin, now \$395, may also get a repositioned — and higher — price, Stamen hinted. Terms of the acquisition were not disclosed.

DG to stockholders: Hold tight

BY NELL MARGOLIS
CW STAFF

With his company awash in red ink and falling revenue, Data General Corp. Chief Executive Officer Edson de Castro asked stockholders to take a leap of faith last week — and those who attended DG's annual meeting appeared willing to do so.

"Frankly, I wouldn't expect anyone to rate our earnings potential as anything but fairly dismal in recent years," de Castro said. "We haven't done very well."

What is more, he added, "the outlook for the immediate coming quarters . . . must be characterized as uncertain."

Nevertheless, de Castro urged stockholders to ride out the hard times and wait for the second incarnation of the company. While reassuring users of its proprietary systems that their product lines would not be cut adrift, de Castro made it clear that DG is staking its future on what analysts have characterized as a bold but chancy move into the reduced instruction set computing-based, Unix-driven world of standards and open architecture.

Do or die

In three weeks, DG is slated to preview the product line on which its do-or-die strategy ultimately rides: its Motorola,

Inc. 88000-based open systems computers. According to de Castro, the machines are still on schedule for a spring introduction.

Analysts have noted that no matter how solid the technology, the Motorola line will go nowhere without software applications.

Echoing their observations and conceding that as a proprietary systems vendor "we've always had a hard time when we've knocked on the door of software developers," de Castro said that DG has met the problem head-on: In two weeks, the company will introduce what he called "an impressive group" of software developers that have signed on to port applications to the upcoming DG/Motorola platform.

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U.S. presses Korea to open telecom market

SEOUL, South Korea — The Bush administration has reportedly targeted South Korea for trade retaliation and is expected to increase trade pressures against that nation, thereby escalating a war of nerves between Seoul and Washington, D.C.

According to sources, the U.S. Trade Representative (USTR) had already marked Korea as a country that persists in unfair trade practices with the U.S., especially after the closure of its telecommunications and value-added services market.

According to an investigation by the USTR, the 1988 Korean telecommunications market was estimated at \$1.3 billion, based on the 1985 value of the dollar. However, the USTR complained that Korea did not import any telecommunications products from the U.S. last year.

It is generally expected that the Bush administration will put Korea at the top of the list of countries claimed to be engaged in unfair trade with the U.S. As a result, Seoul has been asked to negotiate with the U.S. govern-

ment to solve the issue within the year.

If Korea fails to reach an agreement with the U.S. over the trade imbalance within a year, the U.S. is expected to take retaliatory steps through an omnibus trade bill.

The South Korean government plans to hold talks with the U.S. to lower its trade barriers and open the domestic market wider to imports of U.S. telecommunications products. According to Korean Trade and Industry Ministry sources, the

trade talks with the U.S. will be held in Washington, D.C., early next month. Sources also said Korea is prepared to make some concessions.

Meanwhile, the U.S. has threatened trade sanctions in the form of 100% tariffs on the

import of some Korean products unless Seoul opens its domestic telecommunications market.

Many local business experts are worried that Korea might be one of the first targets of the U.S.' strong protectionist omnibus trade bill. They have advised the government to cut the trade surplus with the U.S. by some \$2 billion this year from the \$8.5 billion posted last year.

Atari zaps Nintendo with lawsuit

It may have fast action, constant maneuvering and colorful figures trying to vaporize each other, but the latest from video entertainment masters Atari Corp. and Nintendo Co. isn't fun and games. Last week, Sunnyvale, Calif.-based Atari fired off a \$250 million lawsuit alleging antitrust violations, racketeering and unfair business practices against the Japanese-based Nintendo and its U.S. subsidiary, Nintendo of America, Inc.

According to Atari's complaint, Nintendo — recently in the news as one of the hottest Christmas-list entries — is playing monopoly.

The Japanese company, Atari contended, is barring creators of games licensed to run on Nintendo systems from selling their wares for use on other companies' video game systems. "Developers are faced with the choice between selling games only to Nintendo customers or not selling," the complaint said.

Atari's suit is meritless and "simply a sour grapes response by a company that has failed to capitalize on its past position as the market leader," said Nintendo Senior Vice-President Howard Lincoln. Baseless or not, Nintendo said that it will mount a vigorous defense to Atari's claims.

Theirs.



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Market Vision

FROM PAGE 99

od, brokerage firms are looking for better, more productive ways to do things," he said. "The growth of workstations [for financial applications] that we expected by 1990 has already happened."

Accompanying Wall Street's

workstation technology revolution is a major change in market dynamics, as brokerage industry MIS departments attempt to gain control of end-user — in this case, trader — technology. This change represents both a challenge and an opportunity for Market Vision.

"The most strategic organizations are forming partnerships with their traders, and it's in the

traders' best interest to find a strong ally in MIS," Adiletta said. "In some accounts, we still sell directly to the traders. In others, we act as a go-between. It all depends on a lot of factors, including the seniority of the trader, the firm's management of information services and politics."

Market Vision has had to change its strategy to be more

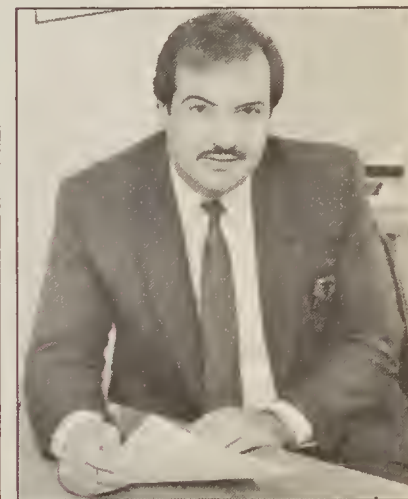
flexible — allowing customers to port their own market data to a Market Vision system, for example, Adiletta said. That helps a brokerage firm's MIS department customize systems for its traders, according to Fred Edelstein, corporate vice-president of the information systems division at Drexel Burnham Lambert, Inc.

"Whether we provide our

own solution or someone else's doesn't really matter — the important thing is to support the traders," Edelstein said. The firm's products "are modular, so people in our development organizations can work out deals in buying those products."

Market Vision competes with subsidiaries of two information services giants: Automatic Data Processing, Inc.'s Comtrend division and Knight-Ridder, Inc.'s Trade Center unit. Market Vision is the smallest in its niche,

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THE MOST strategic organizations are forming partnerships with their traders, and it's in the traders' best interest to find a strong ally in MIS."

WILLIAM ADILETTA
MARKET VISION

but the only independent, Adiletta said. The firm also boasts joint marketing pacts with DEC, Sun and Apollo and claims the only VAX-based database sold to the financial industry.

The firm's philosophy is closeness to the customer. Adiletta even opened his own trading account to run his company's packages under game-day conditions. "I learned firsthand about losing money when you're not paying attention," he said.

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And now they are called Bull H. N.

BOSTON — What's in a name? Plenty, according to Roland D. Pampel, who went to bed last Monday night as chief executive officer of Honeywell Bull, Inc. and woke up as CEO of Bull H. N. Information Systems, Inc.

The Billerica, Mass.-based company's name change has

been in the works since Groupe Bull became a 65% owner of the Bull/Honeywell, Inc./NEC Corp. joint venture late last month. No mere cosmetic stroke, the new name is significant, Pampel said, primarily because "it recognizes that a single partner, Groupe Bull, will provide the leadership

for this partnership from now on."

The H for Honeywell and N for NEC — not to mention the other 22 letters — appear to be largely ceremonial. "The company," according to its printed announcement, "will commonly refer to itself in its advertising,

marketing material, signage and logotype simply as Bull."

Honeywell's status as a major Bull customer and, through its federal systems group, as the channel through which Bull markets to the U.S. government will continue undisturbed, according to a Bull spokesman.

Bull and European sister company Bull SA will operate as technology partners.

IN BRIEF

AT&T shifters

Come April, Charles Marshall, currently one of three AT&T vice-chairmen, will retire from his executive job and also from his seat on the communications giant's board — a move that will trigger some senior-level shifts at the company.

Most likely to succeed the departing vice-chairman is 41-year-old AT&T Senior Vice-President John Zeglis, who has reportedly already been named to take over Marshall's responsibility for government and regulatory affairs.

.....

Play it again

Apollo Computer, Inc. cofounder and chief technical officer David Nelson resigned earlier this month to reembark on the entrepreneurial route. Nelson's embryonic new venture, Envision Systems, Inc., will target an amalgam of computer and video technology. Nelson is not the first Apollo cofounder to decide to do it one more time; William Poduska, who spearheaded the Chelmsford, Mass.-based workstation pioneer along with Nelson, left three years ago to found supercomputer workstation maker Stellar Computer, Inc.

.....

Pandora division

It only contributes about 3% of total revenue, but Unisys Corp.'s Surveillance and Fire Control Division has been responsible for a higher percentage of overall embarrassment to the \$9.9 billion company.

Under internal investigation since 1987 and now the subject of a federal probe as well, the Alexandria, Va.-based former Sperry Corp. division has already generated senior management changes, including the retirement of its former chief.

Last week, Unisys issued a public statement of "deep dismay and indignation" at the latest findings from its Alexandria digs — illegal political contribution activities on the part of a former company employee and a former Unisys consultant.



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COMPUTERWORLD

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EDI is starting to take off

Electronic data interchange offers an opportunity for an early start

BY JANET MASON
SPECIAL TO CW



Employment opportunities in electronic data interchange, or EDI, are proliferating as fast

as the technology.

First introduced more than a decade ago by the trucking industry, EDI — the electronic exchange of commonly formatted documents such as orders and invoices — is rapidly becoming a standard way of doing business across the industrial spectrum.

The growth of the field is evident in the business of third-party EDI providers, whose revenues were \$60 million last year and should be \$90 million in 1990, says Mark Winther, vice-president of electronic communications services at Link Resources Corp., a New York-based market research firm. He estimates that approximately 6,000 organizations now use EDI and as many as 18,000 will use EDI by 1992.

Since EDI is still in an embryonic stage at most companies, the field is rife with opportunities and the promise of rapid advancement, according to people already in the industry. And while information systems professionals concur that salaries

are no higher in EDI than in other areas, working with the technology offers higher visibility than more traditional realms.

In some ways, EDI is a paradox. "EDI is specialized," says Sam S. Valanju, director of information systems at Rockwell International's auto operations in Troy, Mich. "But at the same time, it broadens your perspective because you're dealing with more people, more applications, and you get to see more of the industry."

EDI can open doors

Lee Foote, EDI manager at Du Pont Co. in Wilmington, Del., says an IS person can enter the management ranks through EDI. "The activity is growing from the ground floor and will eventually require a team leader," he says.

Foote says these opportunities tend to be in larger companies in various industries, including transportation and the manufacture of automobiles, textiles, chemicals and metals. The federal government is also using EDI to exchange information with its contractors and suppliers, a move that will affect nearly every sector of the economy.

Job openings can also be found with an increasing number of third-party suppliers of EDI

services. "Third-party networks, such as GE Information Services and McDonnell Douglas, are becoming more important," says Steve Marschall, a consultant at Computer Task Group, Inc. in Buffalo, N.Y.

ONE WAY PEOPLE get started in EDI — the best way, according to one consultant — is through involvement with the applications that lend themselves to the technology, such as ordering, invoice and warehouse systems.

Although there are many more user organizations than third-party vendors, Marschall says that the employment opportunities probably are split evenly between the two areas because individual third-party vendors employ more EDI workers than individual user companies.

One way people get started in EDI — the best way, according to Marschall — is through involvement with the applications that lend themselves to the technology, such as ordering, invoice and warehouse systems.

"The applications are the mainstay of the operation because the EDI software is basically easy to learn," Marschall says.

To grasp the information needed for EDI transactions, IS employees must understand not only the business of their company but also the suppliers and customers with whom they are sharing information. Working in EDI puts IS employees in close touch with the company's customers, suppliers and in-house users.

"There's lots of contact, so EDI employees have to commu-

partially based on them. EDI incorporates telecommunications, but this aspect is likely to be handled by specialists, at least at companies large enough to have a telecommunications department, Foote says.

Three-tiered personnel

At Rockwell International, Valanju oversees a staff of EDI employees in three typical categories. "It's the job of the project manager to understand the business of the applications," he says, "and to put the controls in place to ensure that the system is running smoothly."

At the next level are programmers and programmer analysts. Like the project manager, these people have to understand the business of the suppliers and customers, according to Valanju. Initially, they developed the system, and now they add new customers and suppliers to it.

Rockwell International's EDI system also has a production coordinator whose job is to resolve problems. "This person monitors the progress of the system, handles customer calls and interfaces with telecommunications," Valanju says.

Rockwell's initial EDI applications are order entry and advanced shipping notification. In the future, Valanju expects to see more complex EDI applications and functions, including the transmission of computer-generated images.

Mason is a Philadelphia-based freelance journalist.



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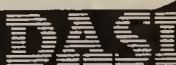
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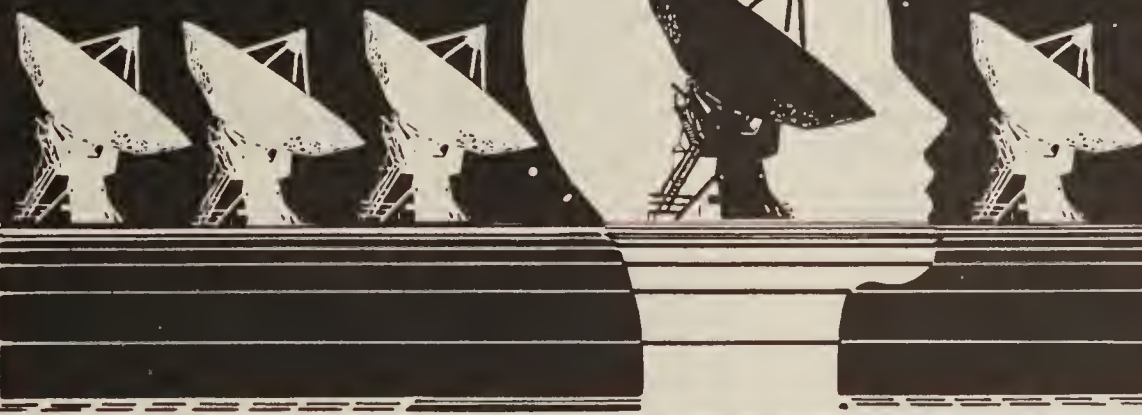
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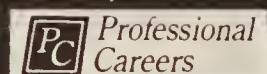
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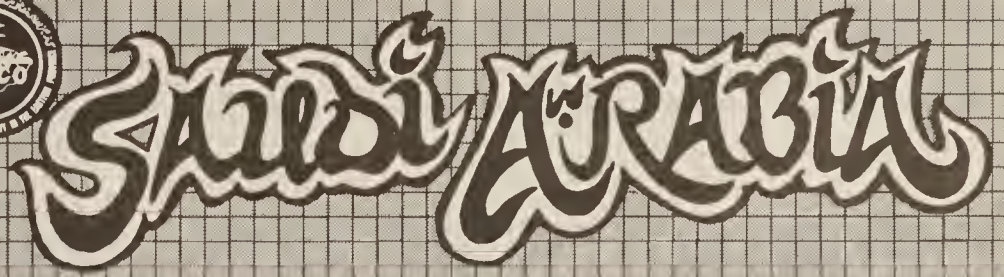
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BY BARBARA SEHR
SPECIAL TO CW

Not long ago, the thought of a programmer developing custom software for microcomputers seemed as ludicrous as Ansel Adams shooting landscapes with an Instamatic.

Mainframes are a natural environment for custom software. A large company's capital investment in the machines amounts to millions of dollars, so creating just the right application for a six-figure fee does not seem out of line.

With microcomputers, however, many users can go to the local computer store and get a lot of productivity from an investment of a few hundred dollars. Although custom software for a personal computer does not bear the six-figure price tag of its mainframe relation, it can cost more than the microcomputer hardware. The custom software's price certainly exceeds that of an off-the-shelf package.

Users whose needs are not addressed by off-the-shelf software might opt for a middle course — arranging for a packaged program to be customized. But this approach will not meet the needs of all users, says Larry Chory, vice-president of C.N.L.

Computer Services, Inc. in Watchung, N.J. Complex rules such as the prevailing wage requirements in some government construction contracts can test the survival of any off-the-shelf package, Chory says.

No matter how friendly the interface on a generic package is, it may not replicate the user's present way of doing business as closely as a custom program, Chory adds.

Custom pricing

At Municipal Data Systems, Inc., a software developer in Skowhegan, Maine, the price of custom software is determined by the complexity of the task and the number of users a system will serve, owner Darrell Moody says. He typically charges \$100 per hour to design a system, including collection of specifications, documentation, testing and debugging. Coding alone usually costs \$75 per hour.

The price can be drastically reduced by sharing the software with other organizations; one police department paid only half the \$50,000 cost of a custom program because the software served as a model for other customers, Moody says.

If you have decided to create a custom program, one key to

choosing among developers is to check out their previous work. In addition to generating references, this procedure might reveal that a previously developed program could be adapted to your needs, Moody says.

To help ensure custom software will be delivered on time,

classic carrot-and-stick situation," Tarter says. But do not pinch pennies, he warns. If the developer is making less money on your order than others, it will go to the bottom of the pile when things get busy.

Additionally, to ensure the software functions according to specifications, the buyer and developer should agree on benchmarks and write them into the contract, says Tarter.

The developer's role does not end when he delivers the soft-

unless he explicitly transfers it to another party, Noerr notes.

If securing the copyright or source code is not possible or is prohibitively expensive, buyers can agree with the developer on how he will maintain the software — charging hourly rates or an annual fee, for example.

But they also should acquire the tools and other materials necessary to maintain the software, have those materials placed in escrow or agree that if the developer no longer can maintain the software, he will provide the materials or place them in escrow, Noerr says.

At the least, buyers need a document spelling out the maintenance materials they need and where to get them, he says.

CW senior writer David Ludlum contributed to this article.

USERS WHOSE needs are not addressed by off-the-shelf software might opt for a middle course — arranging for a packaged program to be customized.

Jeffrey Tarter, editor of Softletter, a Cambridge, Mass., newsletter, recommends three steps:

"The first thing you have to do is know exactly what you want," Tarter says. A major source of delay is customers redesigning software that is under development — "and then they complain that it was late. It's a lot cheaper to do the thinking and prototyping upfront."

The second rule is to be cautious about incorporating leading edge technology into the software. Buyers also should provide financial incentives for the developer to finish on time — and penalties for delivering the product late. "You've got a

ware, Moody says. Regardless of the programmer's expertise or the software's suitability, buyers should expect the need for modifications as users gain experience.

Get the copyright

Therefore, they should understand how the software will be maintained. The best thing to do is obtain the copyright and the source code, says John Noerr, president of Data Securities International, Inc. in San Francisco, which provides an escrow service to protect software assets. Recent changes in federal law provide a contract developer with the copyright to software

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AT Model 339	\$2,125	\$3,600	\$1,800
PS/2 Model 30	\$1,475	\$1,700	\$1,300
PS/2 Model 50	\$2,350	\$2,600	\$1,900
Compaq Portable I	\$650	\$975	\$600
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Portable III	\$2,900	\$3,175	\$2,500
Portable 286	\$1,750	\$1,975	\$1,675
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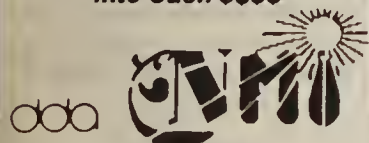
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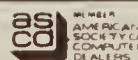
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Request for Proposal No. 1493, due Thursday, March 2, 1989 at 3:30 p.m. for the migration of the existing Florida Management System Software to a multi-user UNIX environment and the acquisition of five small multi-user UNIX-based minicomputers for the Home Health Services Division of the STATE DEPARTMENT OF HEALTH.

General Request for Proposal No. 1494, due Tuesday, February 21, 1989 at 3:30 p.m. This is a general RFP to be used through January 1990 for the acquisition of graphics/small CAD systems, terminals, plotters, and related peripherals for the STATE OF MISSISSIPPI.

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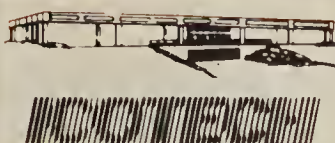
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TRAINING

Take time for student evaluation

Screening and follow-up ensure effectiveness, justify group's existence

BY NAOMI KARTEN
SPECIAL TO CW

Most trainers do not screen enrolled students before a class begins. Even fewer follow up with students after the class to determine if they understood the material and used it to address business needs.

Both screening and follow-up are useful techniques for maximizing training effectiveness. But their importance goes further. Training groups are often the first target in cutbacks, layoffs and budget tightening. Groups that do not do any screening or follow-up may lack the information they need when management challenges them to justify their existence.

Screening lets the trainer gauge the makeup of a class before it begins. Without screening, students might attend the wrong class or attend the right class at the wrong time.

In the first case, students hold a class back or divert the instructor's attention from other students and legitimate problems.

In the second case, students may do fine in class, but in the absence of an immediate need for the material presented, they tend to quickly forget what they

have learned. They may need to take the class again when the business need is at hand, doubling the training effort. They also may call on the information center for extended assistance or lose time in relearning the skills on their own.

Training as a reward

A third situation also has arisen in many organizations: Employees who do not need the training are enrolled by their managers to meet career objectives or as a reward for a job well done. All too often, when an instructor polls a group of students at the start of a class to learn why they are there, one or two admit that they do not know why they are there — their manager directed them to attend.

Some trainers deliberately avoid screening because they think it will be too time-consuming — and it will be if it involves extensive questioning or paperwork. But the process can be kept as simple as a one-minute phone call to each student to ask why they are enrolled and what they hope to gain.

With this information, the instructor can redirect a student if necessary or discourage attendance altogether. Most training

departments lack the clout to reject students, but if screening reveals that too many students are enrolling without a clear business need, the instructor is in a position to gain management support to change the enrollment process.

Simply knowing the class

These training groups will be hard-pressed to justify their existence when management asks for evidence of benefits. Management may not be impressed by a training group that knows how many users it has trained but not how — or even whether — the users are applying the training to business needs.

Like screening, follow-up need not be a complex process bogged down by paperwork and extensive analysis. If time is a constraint, follow-up can consist

from these interviews is useful to the training group in planning future courses. Any benefit that a user reports — or better, demonstrates — that is tied to recent course material is information the training group can use in promoting the value of its instruction.

On the other hand, if follow-up reveals that the training has not been put to use, that information also is important and the instructor needs to learn why it has not been used. It may be that the user attended the wrong class or attended at the wrong time. It may be that the user was eager to begin using the material learned but was prevented by other business priorities.

It may be that user management did not appreciate the importance of putting the training to work immediately. Or it may be that the class itself was not well-presented.

Whatever the reasons, trainers who identify the factors that detract from effectiveness can take steps to rectify the situation.

Screening and follow-up improve the probability that instructors will provide training that will be put to use. In the process, it helps demonstrate the value of training to the organization. For trainers, it can provide a big benefit for a small effort.

Karten is president of Karten Associates in Randolph, Mass.

GROUPS THAT do not do any screening or follow-up may lack the information they need when management challenges them to justify their existence.

makeup in advance is also a benefit of screening. It gives the instructor the opportunity to orient class material to the specific needs of participants and to personalize the class through the use of information gathered during these brief interviews.

Feedback from trainers indicates they fail to follow up for two reasons. Some trainers simply lack the time — a familiar situation that all instructors can relate to. But others feel that follow-up is not their job. Their function, as they view it, is to provide the training; what users do with it is their own choice.

of brief phone calls to a random selection of students 30 to 60 days after completion of a class.

Worker benefits

The trainer needs to find out if students have used the material, how they have done so and the resulting benefits — or, if students have not used the material, why not. When time permits, one-on-one meetings with a small number of users are valuable in gathering more detailed information about applications developed, benefits gained and problems avoided.

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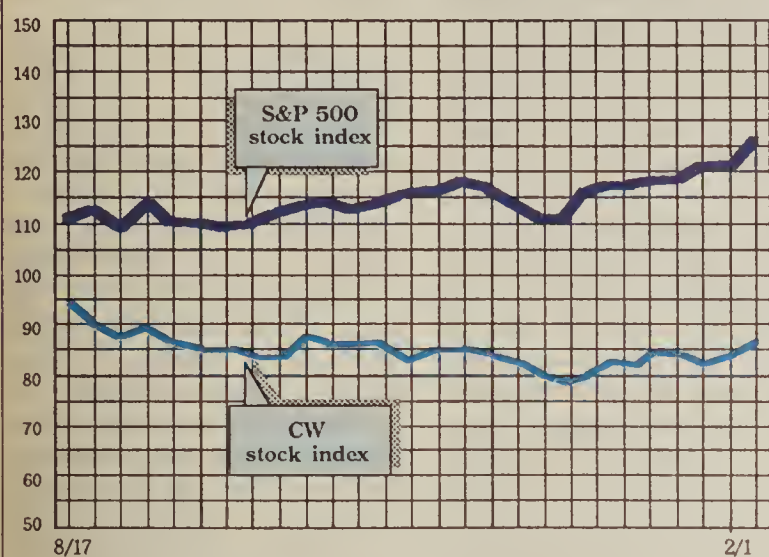
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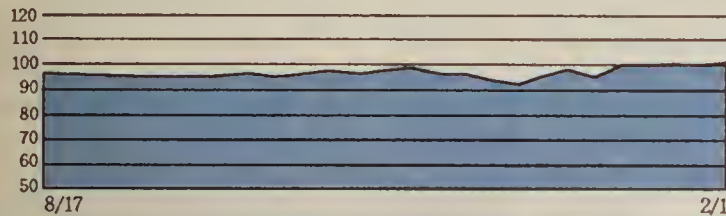
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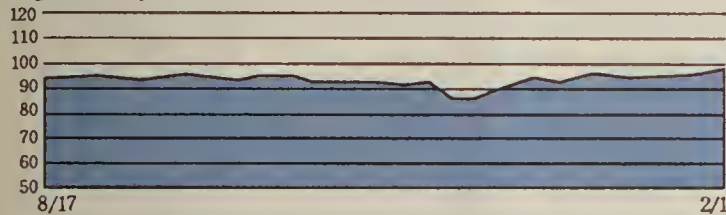


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Software & DP Services	108.5	113.0
Semiconductors	55.7	57.9
Peripherals & Subsystems	80.2	81.9
Leasing Companies	95.0	96.9
Composite Index	83.2	85.6
S&P 500 Index	121.6	125.2

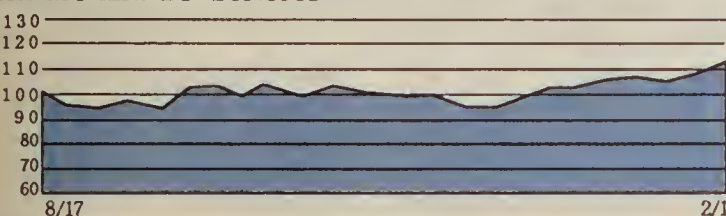
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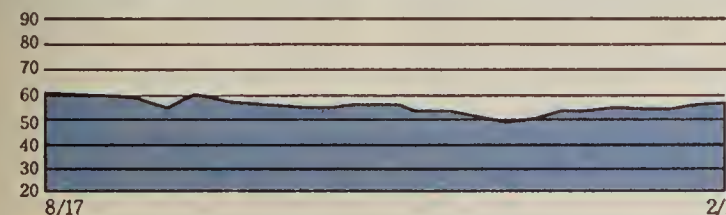
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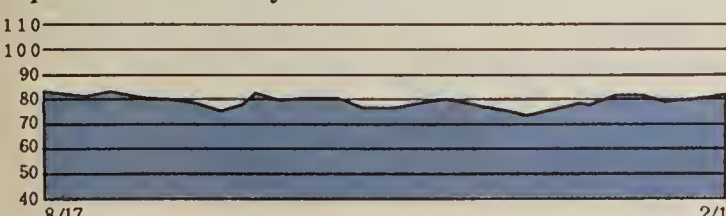
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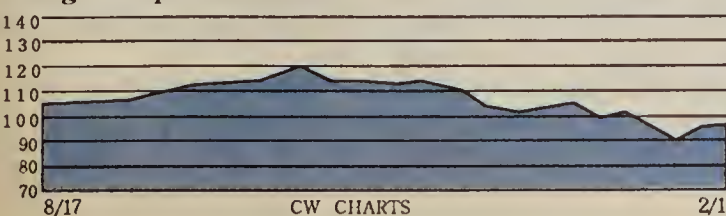
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Peripherals and Subsystems



Leasing Companies



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEB. 1, 1989

EXCH	52-WEEK RANGE (1)	CLOSE FEB. 1 1989	WEEK NET CHNG	WEEK PCT CHNG
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Communications and Network Services

N	AMERICAN INFO TECHS CORP	53	42	51.875	2.5	5.1
Q	ANDREW CORP	20	13	20	0.5	2.6
Q	ARTEL COMM CORP	3	1	1.75	0.2	12.0
N	AT&T	32	24	32.125	1.3	4.0
Q	AVANT GARDE COMP INC	3	0	0.438	0.0	7.6
Q	AVANTEK INC	8	4	5.75	0.0	0.0
N	AYDIN CORP	17	13	14.25	-0.8	-5.0
N	BELL ATLANTIC CORP	76	64	75.25	2.1	2.9
N	BELLSOUTH CORP	44	37	42.375	0.8	1.8
Q	COMPRESSION LABS INC	5	3	3.5	0.3	7.7
Q	COMPUTER NETWORK TECH	2	1	1.782	-0.1	-4.2
Q	CONTEL CORP	45	31	44.75	0.5	1.1
Q	DATA SWITCH CORP	10	5	5.375	-0.3	-4.4
Q	DIGITAL COMM ASSOC	38	17	23.875	-0.6	-2.6
Q	DYNATECH CORP	24	17	18.75	0.5	2.7
Q	FIBRONICS INTERNATIONAL INC	5	2	4	0.3	6.7
Q	GANDOLF TECHNOLOGIES	8	5	4.875	-0.5	-9.3
Q	GENERAL DATACOMMINDS	5	3	5.125	0.5	10.8
N	GTE CORP	47	34	46.5	0.9	1.9
Q	INFOTRON SYS CORP	14	7	11.125	0.9	8.5
N	ITT CORP	55	44	54.5	0.3	0.5
N	M A COM INC	11	8	8.5	-0.4	-4.2
Q	MCI COMMUNICATIONS CORP	26	10	25.75	2.9	12.6
Q	NETWORK EQUIPMENT TECH INC	23	14	19.5	0.0	0.0
Q	NETWORK SYS CORP	12	7	9.625	0.1	1.3
N	NORTHERN TELECOM LTD	20	15	15.75	0.0	0.0
Q	NOVELL INC	33	18	32.5	2.6	8.8
N	NYNEX CORP	71	61	69.625	1.5	2.2
N	PACIFIC TELESIS GROUP	34	27	33.25	0.6	1.9
N	PARADYNE CORP	10	4	10.125	0.0	0.0
A	PENRIL CORP	5	3	4.563	0.1	1.4
N	PLESSEY PLC	44	25	42.25	0.3	0.7
N	SCIENTIFIC ATLANTA INC	16	10	14.625	0.5	3.5
N	SOUTHWESTERN BELL CORP	44	34	43.375	0.5	1.2
Q	3 COM CORP	25	16	25.375	2.0	8.6
N	U S WEST INC	63	50	62	2.1	3.5

Computer Systems

Q	ALLIANT COMPUTER SYS	9	3	3.5	-0.1	-3.4
Q	ALPHA MICROSYSTEMS	8	4	7	0.0	0.0
Q	ALTOS COMPUTER SYS	13	7	7.625	0.4	5.2
A	AMDAHL CORP	28	15	19.875	-0.9	-4.2
Q	APOLLO COMPUTER INC	17	7	7.75	-0.1	-1.6
Q	APPLE COMPUTER INC	48	36	39.25	-2.3	-5.4
N	BOLT BERANEK & NEWMAN	19	10	10.25	0.0	0.0
Q	BRITTON LEE INC	3	1	3.188	0.1	4.1
Q	COMPAQ COMPUTER CORP	74	42	73.25	5.6	8.3
Q	COMPUTER AUTOMATION INC	14	3	5.625	0.8	15.4
A	COMPUTER CONSOLES INC	13	5	12.5	0.0	0.0
Q	CONCURRENT COMP CORP	7	4	5.0125	0.1	2.8
N	CONTROL DATA CORP	31	16	20.25	-0.3	-1.2
Q	CONVEX COMPUTER CORP	11	6	10.875	0.0	0.0
N	CRAY RESH INC	89	53	61.75	1.5	2.5
Q	DAISY SYS CORP	12	6	6.125	-0.5	-7.5
N	DATA GEN CORP	28	17	18.25	0.9	5.0
N	DATAPoint CORP	6	4	4.375	0.0	0.0
Q	OELL COMPUTER CORP	13	8	8.875	0.1	1.4
N	DIGITAL EQUIP CORP	127	86	119.75	8.1	7.3
N	FLOATING POINT SYS INC	5	2	3.375	0.3	8.0
N	HARRIS CORP	33	25	29	1.0	3.6
N	HEWLETT PACKARD CO	66	44	57.625	1.9	3.4
N	HONEYWELL INC	77	57	63	3.3	5.4
N	IBM	131	104	129.625	6.4	5.2
Q	INFORMATION INTL INC	16	11	14.75	0.3	1.7
Q	IPL SYS INC	6	1	5.5	0.0	0.0
N	MAJ BASIC FOUR INC	21	7	7.375	-0.6	-8.0
N	MATSUSHITA ELEC IND LTD	230	169	195.125	-0.1	-0.1
Q	MEGADATA CORP	4	1	1.688	0.1	3.9
Q	MENTOR GRAPHICS CORP	37	20	33	5.0	17.9
N	NBI INC	7	1	1.625	-0.3	-13.3
N	NCR CORP	70	51	58.25	1.5	2.6
N	PRIME COMPUTER INC	20	12	19.625	0.3	1.3
Q	PYRAMID TECHNOLOGY	18	8	17.75	1.8	10.9
Q	SILICON GRAPHICS CORP	25	14	19.125	0.4	2.0
Q	STRATUS COMPUTER	32	21	30.5	0.5	1.7
Q	SUN MICROSYSTEM INC	20	13	20	1.4	7.4
Q	SYMBOLICS INC	2	1	1.125	0.0	0.0
Q	SEQUENT COMPUTER SYS INC	25	14	23.875	1.9	8.5
N	TANDEM COMPUTERS INC	22	12	20	1.4	7.4
N	TANDY CORP	49	34	42	2.3	5.7
N	ULTIMATE CORP	17	8	9.625	0.8	8.5
N	UNISYS CORP	39	25	29.75	0.8	2.6
A	WANG LABS INC	17	8	9.125	1.1	14.1

Software & DP Services

Q	ADVANCED COMP TECH	3	1	2.688	0.9	53.5
Q	AMERICAN MGMT SYS INC	19	12	16.875	-0.8	-4.3
Q	AMERICAN SOFTWARE INC	18	9	17.625	-0.1	-0.7
N	ANACOMP INC	12	6	6.625	-0.3	-3.6
Q	ANALYSTS INTL CORP	15	7	14.5	0.1	0.9
Q	ASHTON TATE	31	20	22.125	1.3	6.0
Q	ASK COMPUTER SYS INC	17	10	16.875	0.1	0.7
Q	AUTODESK INC	32	17	30.25	-0.5	-1.6
N	AUTO DATA PROCESSING	47	35	40.5	2.0	5.2
Q	BMC SOFTWARE INC	17	8	16	2.0	14.1
Q	BOOLE & BABBAGE INC	14	8	13	1.3	10.6
N	BUSINESSLAND INC	15	8	13.625	0.0	0.0
N	COMPUTER ASSOC INTL INC	39	24	38.25	2.9	8.1
Q	COMPUTER HORIZONS CORP	12	7	10	0.1	1.3
N	COMPUTER SCIENCES CORP	53	38	52.125	3.0	6.1
Q	CORPORATE SOFTWARE	15	8	10.5	0.0	0.0
N	COMPUTER TASK GROUP INC	17	10	13.5	0.3	1.9
Q	COGNOS INC	9	5	8.875	-0.1	-1.4
Q	COMSHARE INC	26	13	25.25	1.3	5.2
Q	CULLINET SOFTWARE INC	9	4	6.5	0.4	6.1
N	OUQUESNE SYS INC	24	16	22.125	0.0	0.0
N	GENERAL MTRS (CLS E)	47	36	46.5	0.8	1.6
Q	HOGAN SYS INC	6	3	4.875	-0.1	-2.5
Q	INFORMIX CORP	25	7	9	-0.3	-2.7
Q	INTELLICORP INC	4	2	3.375	0.3	8.0
Q	KEANE INC	19	7	18.5	0.3	1.4
Q	LOTUS DEV CORP	34	15	20.75	1.0	5.1
Q	MANAGEMENT SCI AMER	14	6	8.5	-0.3	-2.9
Q	MICRO PRO INTL CORP	4	2	2.063	-0.1	-5.7
Q	MICROSOFT CORP	71	45	59.25	6.3	11.8
Q	MORINO ASSOCIATES INC	20	12	19.25	0.8	4.1
Q	NATIONAL DATA CORP	32	19	25	0.8	3.1
Q	ON LINE SOFTWARE INTL INC	14	4	4.625	0.0	0.0
Q	ORACLE SYS CORP	25	12	24.5	1.3	5.4
N	PANSONIC SYS INC	19	12	14.625	0.8	5.4
Q	PHOENIX TECHNOLOGIES INC	18	12	16	0.6	4.1
Q	POLICY MGMT SYS CORP	26	20	25	1.0	4.2
Q	PROGRAMMING & SYS INC	18	10	16.5	0.1	0.8
Q	RABBIT SOFTWARE INC	3	2	2.875	-0.1	-4.2
Q	RELATIONAL TECHNOLOGY INC	21	12	14.375	0.4	2.7
N	REYNOLDS & REYNOLDS CO	28	26	27.875	0.6	2.3
Q	SEI CORP	22	14	17	0.3	1.5
Q	SHAREO MEO SYS CORP	27	14	18.375	1.4	8.1
Q	SAGE SOFTWARE INC	8	5	7.75	0.0	0.0

Q	SOFTWARE PUBG CORP	27	9	20.375	2.0	10.9
A	STERLING SOFTWARE INC	9	5	6.75	0.8	12.5
Q	SUNGARD DATA SYS INC	20	14	14.875	-0.1	-0.8
Q	SYSTEMATICS INC	34	26	30.75	0.3	0.8
N	SYS. SOFT INC	26	8	25	4.8	23.5
Q	VM SOFTWARE INC	21	7	20	2.9	16.8

Semiconductors

N	AOV MICRO DEVICES INC	17	7	9	0.3	2.9
N	ANALOG DEVICES INC	16	10	12.375	0.6	5.3
Q	ANALOGIC CORP	10	6	9.375	0.3	2.7
Q	CHIPS & TECHNOLOGIES INC	21	11	16	0.8	4.9
Q	INTEL CORP	37	19	26.75	2.0	8.1
Q	LSI LOGIC CORP	14	7	11.375	0.6	5.8
Q	MICRON TECHNOLOGY INC	26	12	17.625	1.4	8.5
N	MOTOROLA INC	55	36	45.25	1.5	3.4
N	NATL SEMICONDUCTOR	15	8	8.625	-0.1	-1.4
N	TEXAS INSTRS INC	57	35	43.125	0.3	0.6
A	WESTERN DIGITAL CORP	18	11	14	0.3	1.8

Peripherals

Q	ALLOY COMP	5	2	2.125	-0.1	-5.6
N	AMINTL INC	6	3	5.5	-0.1	-2.2
Q	AST RESH INC	17	7	7.75	-0.1	-1.6
Q	AUTO TROL TECH CORP	6	4	5.125	0.5	10.8
Q	BANCTEC INC	12	6	11.125	0.1	1.1
Q	CIPHER DATA PRODS INC	11	7	10	-0.3	-2.4
A	COGNITRONICS CORP	4	2	3.125	0.1	4.2
Q	CONNOR PERIPHERALS	10	7	8.375	0.0	0.0
A	DATAPRODUCTS CORP	15	8	14.375	0.1	0.9
A	DATARAM CORP	9	6	9	1.4	18.0
N	EASTMAN KODAK CO	50	39	48.875	1.8	3.7
Q	E M C CORP MASS	19	4	4.875	-0.1	-2.5
Q	EMULEX CORP	12	5	11.875	0.9	8.0
Q	EVANS & SUTHERLAND	23	13	16	0.3	1.6
Q	ICOT CORP	5	2	2.5	0.0	0.0
Q	INTERLEAF INC	21	6	6.875	-0.8	-9.8
Q	IONEGA CORP	5	2	3	0.1	4.3
Q	LEE DATA CORP	4	3	2.813	-0.1	-4.3
Q	MASSTOR SYS CORP	4	2	2.875	-0.3	-9.8
Q	MAXTOR CORP	16	6	9	0.8	9.1
Q	MICROPOLIS CORP	30	6	7.25	0.6	9.4
Q	MINISCRIBE CORP	14	6	6.5	0.0	0.0
N	MINNESOTA MNG & MFG CO	70	55	68.125	2.4	3.6
Q	PERSONAL COMPUTER PRODUCTS INC	7	4	4.313	-0.4	-8.0
Q	PRIAM CORP	3	1	1	-0.2	-15.8
Q	PRINTRONIX INC	11	8	7.875	0.1	1.6
N	QMS INC	12	6	9	0.1	1.4
Q	QUANTUM CORP	15	10	14.25	0.3	1.8
N	RECOGNITION EQUIP INC	12	6	10.625	-0.8	-6.6
Q	REXON INC	9	4	6.625	0.1	1.9
Q	SEAGATE TECHNOLOGY	23	7	12	1.4	12.9
N	STORAGE TECH CORP	4	1	1.875	0.1	7.1

Windows open on X terminals

BY PATRICIA KEEFE
CW STAFF

If proponents of X Window System have their way, fewer and fewer networked users will be saying, "I don't do Windows."

Windowing is seen as the next phase in computer networking. There are at least three X Window standard-based boxes on the market whose primary benefits tend to include very high-resolution bit-mapped graphics, concurrent access to heterogeneous network resources and a measurable cost reduction over full-blown Unix workstations.

Suppliers of "X terminals" include Visual Technology, Inc. in Lowell, Mass., Network Computing Devices, Inc. in Mountain View, Calif. (see story page 65), and Acer Counterpoint, Inc. In addition, Maynard, Mass.-based Digital Equipment Corp. is ex-

pected to jump in shortly with an X Windows box of its own.

"Until these terminals came along, the only way to run [applications like ours] was on fairly expensive technical workstations costing up to \$10,000," said John Hime, vice-president of marketing at Frame Technology Corp. Frame's desktop publishing package is purported to be one of the biggest selling applications on Sun Microsystems, Inc. workstations.

X Window Version 11, a de facto windowing environment developed at MIT for networks, opened the curtain on network graphics display stations. The windowing capability is divided into two parts: user interaction, or display server, and applications execution, or host computation.

It is the display server portion that is fueling this niche. These

Motorola, Inc. 68000-based boxes reportedly enable users to output text and graphics inexpensively from a medley of remote processors into separate windows on a large screen. Traffic load over the network is lightened because processing and storage activities are located on the host CPU.

The attraction for users is as clear as day: low cost and sparkling resolution up to 1,024 by 1,024 pixels.

"It provides you with what most people require in a workstation, except for the computing power. For users who don't necessarily need that, what's different here is the lower cost," said William King, a graphics specialist at the Minnesota Supercomputing Center. The center is affiliated with the University of Minnesota.

For networked users who do

not need a full-blown workstation, X terminals reportedly can be had for as little as a fifth of the cost of a Sun or Apollo Computer, Inc. workstation. A bottom-of-the-line workstation costs about \$5,000, vs. \$2,500 for a Network Computing Devices NCD16 or \$1,900 for Visual's 640 XDS.

Lower performance

The trade-off, said George Colony, president of Forrester Research, Inc., a market analysis firm in Cambridge, Mass., is that X terminals also provide one-fifteenth the performance of their more powerful cousins. But if the user is running an application that needs the power of a big computer, then performance is not an issue, according to Bruce Borden, a vice-president at Ardent Computer Corp., because the X terminal will do its processing on an Ardent or Tandem Computers, Inc. host or one in the DEC VAX class. "It's the complete opposite of the down-

sizing trend," Borden said.

Industry observers are giving X terminal builders a roughly two- to three-year window to make their mark before the major minicomputer makers and system houses lower the shade on third parties.

"The key is not the technology; it's price, distribution and manufacturing," Colony said.

Ardent manufactures computers in the \$100,000 range and expects "quite a few" customers to purchase the devices as a natural addition to their host-class systems, he said.

This kind of high-end interest means that the survival of smaller X terminal makers will likely rely on their ability to cut the best OEM deals. "It's probably true," said Brian Chapin, a vice-president at Visual Technology. Visual has already cut several OEM deals, the most lucrative with Kubota Computers, a Japanese manufacturer that also builds Mips Computer Systems, Inc. and Ardent boxes.

Dim scene

FROM PAGE 1

number crunching and high-performance graphics capabilities as well as visualization. Research scientists in the fields of computational physics, chemistry, fluid dynamics and mechanical computer-aided engineering quickly lined up for a peek.

At the University of Lowell, for example, a trio of Stellar Graphics Supercomputer Model GS1000s are used for computer-aided chemistry and computer-aided design [CW, Dec. 5]. "We've increased our computation speed nearly 30 times," boasted Tom Costello, vice-president of technology acquisition and planning at the Lowell, Mass., institution.

But their use is not limited to

Graphics supercomputers appeal to users who cannot afford a minisupercomputer but need that performance. However, the cost of running applications on a system up to 20 times faster than the most sophisticated personal computer was dear, typically around \$100,000. It was still less than half the price for minisupers offering comparable computing power, but the budget pinch could be extreme.

Stellar Chairman and Chief Executive Officer John William Poduska noted this at the introduction of the GS1000 last March when he promised a machine twice as powerful but priced the same as the \$104,000 GS1000 within a year. That tempting follow-on has yet to be announced.

Meanwhile, users wait. John Ranelletti, deputy director of the

is the networking traffic jam the machines sometimes create. One machine may require 600M byte/sec. in bandwidth, while the typical connection between a CPU and graphics terminal on a local-area network averages about 125K byte/sec.

But this knot has begun to untangle. Although products based on the Fiber Distributed Data Interface (FDDI) are not expected until about 1992, the FDDI's 100M bit/sec. data transfer rate will leave the 10M bit/sec. Ethernet rate in the dust.

Additionally, the High-Speed Channel — a point-to-point channel standard that its authors claim can hit peak data transfer rates of 1,600M bit/sec. — is expected to be put up for public review by the American National Standards Institute in the near future [CW, Sept. 5].

The first place vendors often look is in the academic world. Academic use accounted for 30% of Stellar's first-year sales, a spokeswoman said, but a more real-life scenario would shift heavily towards industrial uses.

Although firms such as Santa Barbara, Calif.-based Wavefront Technologies have jumped on the bandwagon, the comparatively slim number of graphics supercomputer users may sway developers to head for the more lucrative PC software market. Consequently, Ardent and Stellar have gone to

lengthy measures to get software programs for their machines to run. "They're all but giving them away," said Dick Shaffer, president of Technologic Partners, a high-technology publishing firm in New York.

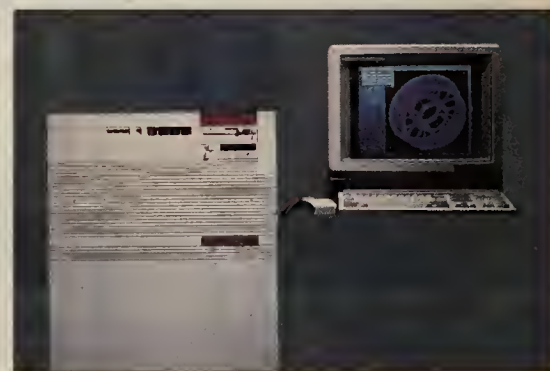
Vendors still have ground to cover. "They must prove to users what is so super about these so-called super devices," Kapoor added. "When all the pieces are together — the network solutions, the software availability — the market will explode, but for now it's slow."

Positive future

But the future looks promising. Ardent President Allen H. Michels said recently that his firm has shipped 199 units since the Titan began shipping in late May, although only 120 were expected to go out the door. Still, Michels confessed, "It's an incredibly competitive market." Stellar reported last month that it had manufactured 200 of its GS1000s, 120 of which have been installed at customer locations and the rest either loaned

out or used internally. As a result, the firm generated \$12.7 million in revenue in only six months of volume shipments.

"Obviously, our market isn't as big as that for \$50,000 workstations," said Ian Edmonds, vice-president of marketing at



Stellar GS1000 goes beyond science

Stellar. Although the figures did not meet the \$16 million to \$18 million in revenue it had projected, Edmonds said the figure is respectable.

While admitting that Stellar may not make much on each sale, Edmonds said, "the important thing is to gain market share."

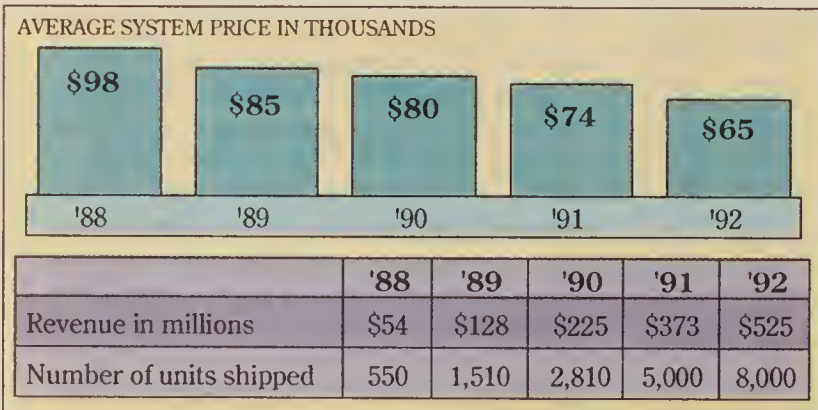
A large amount of support for graphics supercomputers has come from the National Science Foundation. It has called for government funding of graphics computing to the tune of \$2.5 billion by the early 1990s.

The open Unix operating systems should also help the machines' acceptance. "Unix makes it possible for multiple platforms to cooperate in getting the job done, so if it is not the current great equalizer, it is the eventual great equalizer," Trier added. "The functions and acceptance of Unix is growing, and workstation users are leading that."

West Coast Correspondent J. A. Savage and Senior West Coast Correspondent Julie Pitta contributed to this report.

Slow going

High-performance graphics supercomputers are projected to be in only moderate demand during the next few years because of high costs



SOURCE: DATAQUEST, INC.
CW CHART: DOREEN DAHLE

the scientific field. Computer Graphics Laboratories, Inc. (CGL) in Roslyn, N.Y., uses Ardent's Titan graphics supercomputers to help produce animated feature-length films. The Titans replace a roomful of equipment, said J. J. Larrea, CGL's vice-president of engineering.

computer department at the University of California Lawrence Livermore National Laboratory, has two Stellers for prototypes but said he is unlikely to get any more until the price comes down.

Another growing pain graphics supercomputer vendors face

Server relief

Immediate relief comes in the form of Stellar's \$95,000 CS1000 server, which was announced in September and is now available; Ardent announced a similar server in October and expects to ship the \$98,000 machine this quarter.

Additionally, Marlboro, Mass.-based start-up Epoch Systems, Inc. has recently introduced a server for the technical workstation market that promises up to 150G bytes and could go a long way in greasing the networking wheels.

A scarcity of software also exists, and vendors desperately need applications to be ported to their machines. "The result is that even where graphics supercomputers are in existence, there is still light use [being made] of them," said Bob Trier, director of technical programs at the Minneapolis-based Research Consortium, Inc.

Ford possible Prime white knight

BY NELL MARGOLIS
CW STAFF

NATICK, Mass. — Reports that Ford Motor Co. is about to ride to the rescue of embattled takeover target Prime Computer, Inc. swirled through the industry last week, only hours after hostile bidder MAI Basic Four, Inc. extended its offer and announced a new financial backer.

Prime would neither confirm nor deny the scuttlebutt. However, one analyst said that whether true or false, the rumor has bounced what was beginning to look like a hard ball back into MAI's court.

"Prime's stock is now trading at slightly over \$20 per share," said Stephen Dube, an analyst at Shearson Lehman Hutton, Inc. If the stock's price rises higher than the \$20 per share offered by MAI, Dube said, then "the Ford rumor has effectively done what a Ford offer would do: It's forced MAI into a different position."

The Tustin, Calif., aggressor,

he said, "will have to raise the price of its offer or watch it die."

Earlier last week, MAI appeared to be making quantum gains in its attempt to swallow Prime. The would-be acquirer extended its \$20-per-share offer through the 15th of this month, claimed that approximately 73% of Prime's stock has already been tendered and announced that Merrill Lynch & Co. has come on board with financial backing for the deal.

Out in the open

"Now MAI's argument about how many shares have been tendered becomes a moot point," Dube said. "The stockholders can do better on the open market."

Ford or no Ford, he said, "I think we're going to see an end to this battle very soon."

MAI and Prime each has declined to comment on the rumors. However, a source within Prime said, "It's unlikely that any white knight would announce itself before it had to, and

right now, it doesn't have to. The poison pills are still in place. The injunction is still in place."

Shining armor

MAI recently petitioned the Delaware Chancery Court to reconsider striking down the antitakeover, or poison-pill, provisions enacted by Prime's board several months ago. MAI's motion to lift a temporary injunction against its tender offer is pending before the U.S. District Court in Massachusetts and is slated for a hearing this week.

"If the injunction is lifted, that might be the occasion on which a white knight would come forward," the Prime source said. "Right now, time is on our side."

Not everyone agreed. "The Ford rumor has been around forever, and they haven't come forward yet," said an analyst who asked not to be identified. "Yes, they're Prime's biggest customer, but I don't think they want to buy the company. I think the MAI acquisition is going to happen."

DB2

FROM PAGE 1

oratory planning council with DB2 development, Dash explained. That means that OS/2 Extended will support requests to remote DB2 systems through IBM users' Systems Network Architecture networks.

"The OS/2 Database Manager will be viewed as the micro DB2," Dash said. "The design points were that it would mimic DB2."

Custom-made

Dash said the point of having a separate DBMS for each environment — micro, mid-range and mainframe — is that each DBMS must be "sized" to the user environment.

For microcomputers, the local DBMS would be the OS/2 Database Manager; for mid-size systems, the SQL/DS relational DBMS; and for mainframes, DB2 itself.

IBM used the three-day DB

Expo to outline its long-range intentions for the DB2 product line, including strengthened security and management controls, more auditing facilities, enhanced performance measurements and the accumulation of all objects in a global directory.

IBM is also considering the release of DB2 tools and utilities to aid in tuning the distributed network. Until now, IBM has left the development of DB2 utilities and tools to third-party developers.

Arms to managers

Dash said that future versions of DB2 would arm MIS managers with far greater control over the increasingly distributed DB2 architecture. He said his laboratory would provide staged levels of distributed facilities in future releases of DB2.

Colin J. White, director of DB/Expo, said IBM has chosen to differentiate its product from other DBMSs by siding with MIS concerns. "Some of the other DBMS vendors have said they'll

provide distributed capability first and add the controls later," White said. "But IBM believes you can't move to a distributed architecture without putting all the managerial controls in place."

Managed or not, the complexities inherent in a distributed DBMS environment could prove to be a real headache for MIS managers, said Chris Date, executive vice-president of Codd & Date Consulting Group.

"The weakest part of security is the network itself," Date told the DB/Expo audience. "And the only protection against that is encryption."

Dash said IBM is also exploring new technologies to enhance DB2, among them expert system techniques.

"We want to use the relational model as a base, while adding some rules and inferential modeling on top of it," Dash said. Parallel processing is also on the horizon, allowing DB2 tasks to be cut into manageable pieces, he added.

New Wave crests with modern DBMS

BY PATRICK WAURZYNIAK
CW STAFF

SAN FRANCISCO — Hewlett-Packard Co. took the wraps off an object-oriented database management system research project last week that the firm has had under development at its software laboratories for several years.

At the Database '89 conference held here, HP demonstrated a prototype version of Iris, an object-oriented database that builds on technology similar to that used in HP's current New Wave software operating environment.

"It's really an extension of what you see in New Wave," said Katie Rotzell, a software development engineer leading the technical project at HP's Data & Languages division. "We're really looking at blowing up New Wave out of the office environment."

Three environments

HP's New Wave — which along with Microsoft Corp.'s Windows was the target of an Apple Computer, Inc. copyright infringement lawsuit filed in March 1988 — currently operates only under the Microsoft MS-DOS operating system.

However, HP said it intends to offer the operating environment under both the OS/2 and Unix operating systems. The Apple lawsuit alleged that New Wave and Windows violated Apple's Macintosh visual displays.

The Iris prototype, using SQL commands, can extract data from SQL-based relational DBMSs, while using its own form of object-oriented data to make the use of such databases much easier.

Prototype demo

HP demonstrated the prototype on an HP 9000 system running HP-UX, which is HP's version of the Unix operating system. The Iris database was able to query HP's existing relational database management system Allbase, which is currently offered on the company's proprietary MPE- and Unix-based system, while using an SQL-like query method that HP calls object SQL, or OSQL.

Although would not say when it might bring such a product to market, the Iris database prototype and its underlying object-oriented technology was characterized by the company as a "tremendous opportunity for the 1990s."

Susan Bockus, product line manager of Information Management Products in HP's Com-

mercial Systems division, said the company has no definite plans for introducing the Iris prototype as a product at the present time.

However, she said that HP currently has the Iris database prototype in testing under strict nondisclosure agreements at several universities and commercial businesses.

A handful of smaller companies have already marketed object-oriented DBMSs such as Servio Logic Development Corp.'s Gemstone object-oriented database and Ontologic, Inc.'s V-Base.

As to whether the Iris prototype could replace today's rela-

IT'S REALLY an extension of what you see in New Wave. We're looking at blowing up New Wave out of the office environment."

KATIE ROTZELL
HEWLETT-PACKARD

tional DBMS products, HP said it sees an eventual Iris-type database being more practical for applications — particularly in engineering environments that require manipulation of extremely complex data sets.

"I believe there will never be a replacement for the relational database, which serves a very large market with a lot of applications," Rotzell said. "They'll need to coexist."

Catch the wave

The Iris database builds on HP's New Wave technology, which uses objects and the Microsoft Windows graphical interface to make processing of data easier for the user.

Rotzell said that an object-oriented database such as Iris most likely would be used in applications with complex data structures, such as computer-aided design, computer-aided software engineering, computer-aided engineering and computer-aided manufacturing, in addition to traditional office environments.

"With objects, I as a user can deal easier with real-world tasks, like making prints," she said. "We think objects are going to make life much easier for users. Virtually any real-world situation can be modeled using objects. We think it also can make things easier for [software] application developers."

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TRENDS

Systems integration

Systems integration is on the mind of every MIS manager, and deciding how to handle it is no easy task.

A recent report from The Ledgeway Group, Inc. in Lexington, Mass., examined the use of outside professional services, including systems integration. The research firm conducted surveys of 178 Fortune 1,000 information systems managers. Notably, about half of the respondents said they do not use outside firms for systems integration and thus have no experience in contracting such services.

Among those managers who do seek outside integration help, however, the primary impetus is a lack of staff expertise, which Ledgeway defined as either a lack of specialized skills among in-house staff or the complete lack of an in-house staff. Cost did not appear to be a driving factor because none of the users chose that answer from the multiple-choice list provided in the survey.

These findings supported Ledgeway's contention that companies turn to outside providers largely for one-time projects of a critical nature, upon the completion of which full-time employees will no longer be needed.

Further, Ledgeway said customers have reported hesitancy in accepting the financial burden of full-time staff in an uncertain economy. One-time expenditures ease operating budgets.

As for the types of vendors that users pick for systems integration, the choices were predictable: systems integrators and consulting firms. Communications firms scored low, and the divested Bell operating companies included on the list did not score at all. It is thought that these firms, which have only recently entered the professional services fray, have yet to build up sufficient credibility with users.

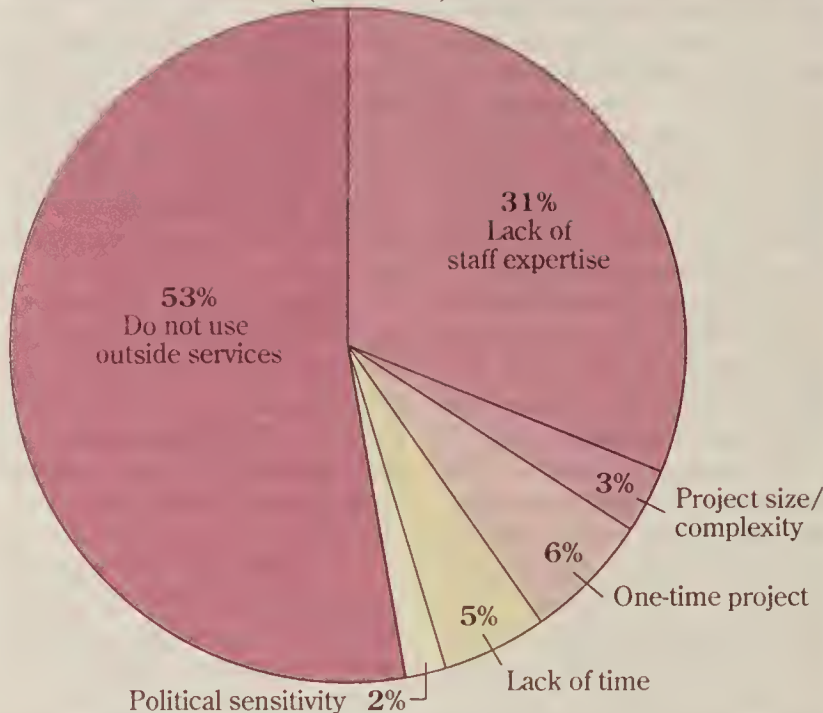
In terms of who is responsible for choosing service providers, IS managers generally make technical recommendations, while upper management has the final say on the purchase. Chief information officers, however, seem to be involved in both roles.

The systems integration market was worth about \$1.6 billion last year and should reap \$3.8 billion by 1992, growing at a compound annual rate of 26%, according to Ledgeway's figures.

LAURA O'CONNELL

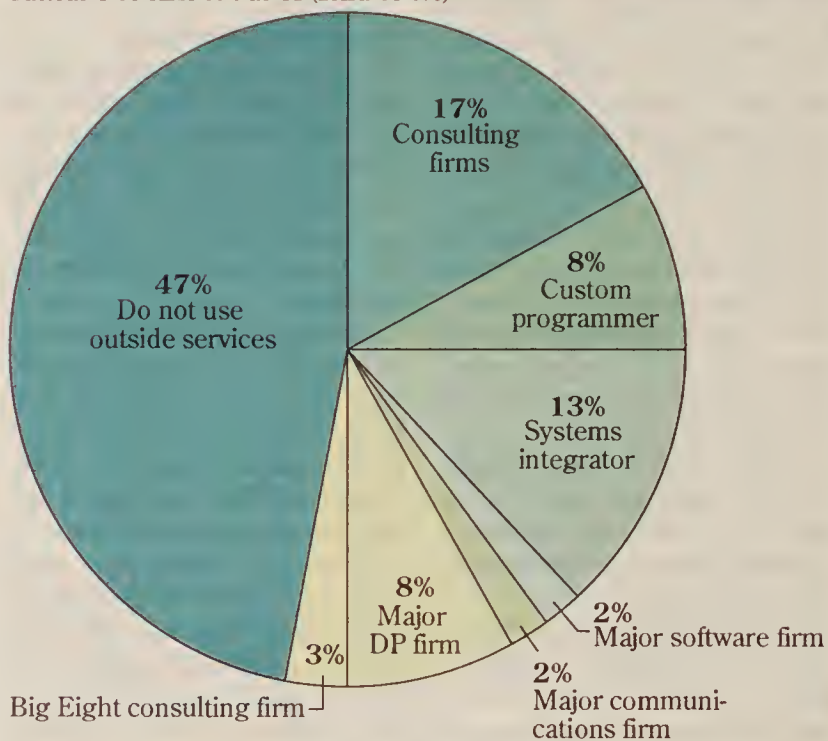
Why some users turn to outside firms . . .

PERCENT OF RESPONDENTS (BASE OF 178)



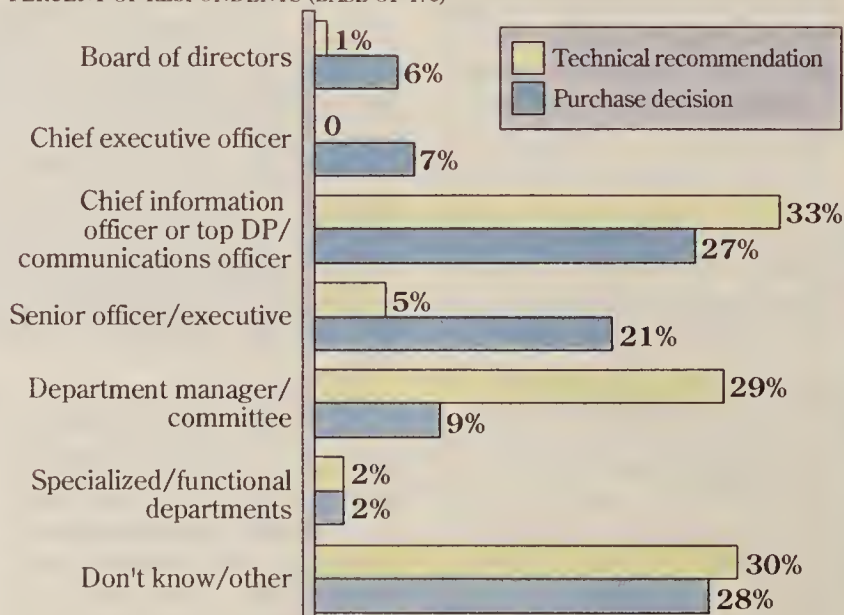
. . . and whom those users choose

PERCENT OF RESPONDENTS (BASE OF 178)



Who's involved in decisions

PERCENT OF RESPONDENTS (BASE OF 178)



SOURCE: THE LEDGEWAY GROUP, INC.
CW CHARTS: FRANK C. O'CONNELL

INSIDE LINES

Card-carrying member. Compaq is developing a 32-bit EISA LAN bus-mastering card to be included in its yet-to-be-built EISA machines. A source close to the firm said the machines will be out in the second half of this year. Compaq is also negotiating a deal with Novell to bundle its forthcoming version of Netware 386, expected to be released this summer, with the Compaq server. The deal calls for Compaq to distribute its configured server with the Novell network operating system, sources said. Novell confirmed it is working with the EISA specifications to develop a driver for EISA systems. It expects to ship the driver when the EISA machines are available, Novell Vice-President Craig Burton said. The firm would not release any EISA machines without cards that exploit the bus, according to a Compaq spokesman.

Let's get fractional. Fractionalized T1 — the ability to purchase and route bundles of 64K bit/sec. channels as a single link — should become a reality next week as AT&T and several former Bell operating companies announce tariffs for the service. This will save big bucks for users with too much traffic for one or two 64K bit/sec. links but not enough to justify full T1, sources said.

RISC-y approach to fault tolerance. Trying to capture federal business that demands Unix, Tandem is expected to introduce a low-end RISC system at the end of the year. The RISC architecture, expected to be supplied by Mips Computer Systems, should achieve fault tolerance through multiple processors. Tandem has been offering an Altos Unix system with little success.

Oh! An internal audit of transaction processing benchmarks at DEC was conducted by "a very skilled panel of technical people" from DEC during the summer, according to Jack Murray at Peat Marwick, the auditor now carrying out the benchmark tests. Peat Marwick, however, was not contacted to perform any tests until September, probably too late to perform an audit before the announced publication date of the benchmark methodology in October. Peter Kastner, now a consultant at the Aberdeen Group in Boston, was the contact person at DEC for Peat Marwick, but after he left DEC in the fall, the benchmark audit effort was left to languish.

Buddy, can you spare \$5 million? Software Publishing, which has been on a major roll after some tough times, doesn't really need the cash. But that apparently has not stopped the firm from pitching its Harvard Total Project Manager to other software houses for \$5 million, our source says. Of course, you can get an individual copy for less.

Maybe we'll send the pre-press. Expect Telenet Communications to announce a "pre-ISDN" high-speed service at Communication Networks '89 in Washington, D.C., this week. Telenet is just one of a flock of carriers that are racing to meet burgeoning demand for wideband (read: anything from 45M to 100M bit/sec.) digital services, Telenet said. However, no ISDN standard exists yet for such services — hence the "pre" aspect to the announcement.

Hold on to that check. The 14-MIPS performance and \$11,900 price tag of DEC's Decstation 3100 is already beginning to shake things up in the workstation world. At Apollo Computer's recent rollout of the Series 10000 Visualization System, Vice-President of Marketing Michael Gallup said his firm should be announcing a workstation in the \$15,000 range within the next quarter or two.

We can't wait to be clarified at Comnet '89, when keynoter Ellen Hancock, an IBM vice-president and general manager of the Communication Products Division, will hold a press briefing after her speech to "clear up" what IBM believes are some misconceptions. According to an industry analyst, IBM's pending sale of the bulk of its Rolm assets to Siemens seems to have garnered an unacceptably negative view in the trade press and is about to undergo spin control. Rolm users can keep the world informed by calling the hot line, 800-343-6474 or 508-879-0700, and passing Siemens stories on to News Editor Pete Bartolik.

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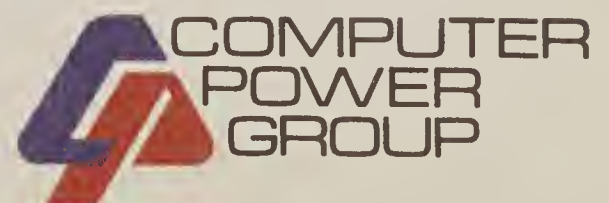
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